PUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Weekly Newspaper – Second-class postage paid at Chicago, Illinois
Vol. VI No. 9 March 1, 1972 Price: $9/year

Users Hit By British Blackouts

By Joseph Hanlon
CW Correspondent

LONDON – Despite nearly a month's warning this year and the experience of the 1970 electricity cuts, few computer users had added emergency power or made additional emergency plans when the coal miner strike hit Britain, shutting off coal supplies to power stations.

But the chaos of the 1970 power cuts was absent this year, not because of better planning by the computer users, but due to the Electricity Generating Board. In 1970 the power workers themselves struck and the cuts were erratic and unscheduled. This year the cuts were announced well in advance so everyone knew when the lights were going out.

In 1970 computer operations came to unexpected and often crashing halts. This year operators shut down the machines properly several minutes before each scheduled cut.

Contingency plans, often not used since the 1970 cuts, were put into practice more quickly and smoothly this time because previous use was still relatively fresh in mind.

The biggest problem for computer users was work backlog, especially data preparation. During the worst weeks, most people lost power for 18 hours.

One service bureau, for example, flew in a generator from Germany in the middle of the strike.

Time-sharing and remote batch systems were particularly vulnerable because terminals often lost

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Marcia Phinney, a data input supervisor; Judy Patton, an assistant DP director; and Phyllis Feingold, a senior systems analyst, check out a Tally printer at the Computer Users' Forum and Exposition. They work for, respectively, the American Mutual Insurance Co., the Harvard Business School and Massachusetts Blue Cross.
(CW Photo by V.J. Farmer)

2,000 Attend Forum; New York Next Stop

BOSTON – About 2,000 computer users from six states braved frigid weather and the worst traveling conditions of the winter to attend the New England Computer Users' Forum and Exposition here last week. (See Pages 4 and 5 for related stories and photos)

Sponsored by *Computerworld*, similar three-day conferences are being held in New York this week, Washington, D.C., next week and six other cities in succeeding weeks.

Users participated in morning panel discussions and workshops each day after hearing national speakers discuss data entry Tuesday, data communications Wednesday and operational efficiency Thursday.

New Signees

Half a dozen firms introduced or showed new products in public for the first time at the afternoon exposition. Within hours after opening ceremonies, three more companies signed up to join the traveling portion of the conference as exhibitors, Computer Caravan officials said.

On the exhibit floor Iomec unveiled its Iodisc Series One data storage system featuring small, inexpensive cartridge disks designed to be used as an alternative to tape cassettes. The cartridge, measuring 8 in. in diameter, contains a flexible disk with a capacity of about 250K bytes.

The drives, available in one or two drive configurations, have

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Calif. Software

Sales Tax Approved, Property Tax Tabled

By Edward J. Bride
Of the CW Staff

SACRAMENTO, Calif. – Computer users won one battle and lost another in their war against new taxes imposed by the state.

The Board of Equalization has adopted a sales tax on software, although it has put off until at least March of 1973 a decision to include the value of software in personal property taxation.

The board recently concluded months of public hearings on the two taxes [CW, Feb. 9], and after evaluating the testimony of users and industry representatives, passed the sales levy, reported Kent Mitchell, a Palo Alto lawyer.

Mitchell was critical of the new 5% sales tax, claiming the board was "trying to implement a value added concept where that concept is in no way a basis for our sales tax laws."

Texas Tax Law

There is a similar tax on software products in Texas, imposed for the state and cities; the state receives 4%, and the cities the additional 1%, thereby reflecting a total tax identical to California's.

It is not known how many other states tax the sale of software products, but user concern lately has been more in the area of property taxes.

Since the California Board of Equalization has now decided to delay the ruling on property taxation, there remains but a minimum of legal precedent for fighting it, other than the Eastern Airlines victory against this taxation in Florida.

Eastern won a tax reduction last year, based on its contention that software, services and training were intangible and so didn't fall under Florida's property tax law [CW, July 28, 1971].

A similar case is on appeal in Washington, D.C., and it could provide additional legal precedent for users, since it is in federal court. The case involves a user victory which has been appealed by a tax assessor.

The California property tax regulation would have declared that a program which is ready for implementation "to perform the functions for which it was designed" is tangible property within the meaning of tax regulations.

The sales tax applies to "canned" programs and custom programs which are transferred to users in machine-readable form.

The state Board of Equalization can be reached through P.O. Box 1799, 95808.

With HP Interface

Calculator Can Control Systems

By Frank Piasta
Of the CW Staff

PALO ALTO, Calif. – A Hewlett-Packard interface allows its programmable calculators to be used for applications traditionally performed by minicomputers.

The interface connects the HP 9800 Series programmable calculators to the company's coupler/controllers to control instrument systems for data acquisition, process control and automatic testing.

The calculator, when used with the coupler/controller, can control instruments, process their measurements, make decisions and generate outputs for process control, and produce plots and graphs, HP said.

Operation is simplified by eliminating the need for the learning of programming languages, the company said.

Communications Links

The coupler/controller, HP said, are programmable two-way digital communications links for instruments, peripherals and computers or calculators. A variety of devices can be attached including digital voltmeters, counters, frequency scanners, tape reader and punches, tape recorders, teleprinters, programmable power supplies, digital recorders and local or remote, dedicated or time-shared computers.

The Model 2570A, capable of two-way communication among as many as eight devices, sells for $1,875. The Model 2575A, which can control up to four devices, is priced at $1,275.

The 9800 Series calculators are desktop programmable units with keyboard control. The Model 10, starting at $2,975, was recently augmented by the Model 20 which offers algebraic programming and sells for $5475 for the basic model. (See Page 15)

The interface kit for either coupler/controller and either calculator is priced at $1,500. The Model 10 calculator requires an additional plug-in peripheral controller priced at $485. Currently, the delivery schedule for the interface is 12 weeks.

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Users Slowed Down by British Blackouts

(Continued from Page 1)

power at different times than the computer. Several bureaus set up air and truck delivery systems.

Essential work, such as payrolls and stock exchange accounting, was completed on schedule.

The national banks, which have hundreds of branches tied to central computers, did have emergency power for the computers and worked Saturdays to clear up backlogs from terminals. In general, bank terminals were not shut down in advance of cuts. Terminal buffers and a sequential transaction numbering system insured that each time terminal power was restored, bank clerks could determine exactly what had been transmitted and what had been lost.

The 1970 cuts caused several examples of damage to computers, particularly head crashes and errors from interrupted runs. This year, damage was less significant, and apparently occurred only when the electricity board jumped the gun and cut power a few minutes early.

British European Airways was caught off-guard by a cut which damaged the motors of the drum storage system, forcing the on-line reservation system down for 10 hours.

An early cut at University Computing Co. wiped clean the high-speed drum; programs recently completed and ready to run, as well as some accounting records, were lost.

Power cuts were scheduled on a rotational basis.

New York Next Stop on Forum Tour

(Continued from Page 1)

an average access time of 60 msec and a transfer rate of 1.2M bit/sec.

The Series One is available with interfaces to adapt it to most popular minicomputers including DEC PDP-8 and PDP-11, HP 2000, Data General Nova, Varian 620 and Microdata minis. The price of the two-drive Model 20 with interface and software is $6,500. Cartridges are $18.50. Delivery is 120 days.

Incoterm Corp. announced the availability of an auxiliary memory system for the SPD 10/20 Intelligent CRT Terminal.

Calcomp gave its first public demonstration of the 1040 magnetic tape system. The plug-to-plug compatible device is designed to replace such IBM drives as the 3420, 2420, and 2401 and can be used with most 360 and 370 models.

The Lockheed Sue minicomputer was also shown for the first time. The mini is available with four memory modules, a 4K by 16-bit and an 8K by 16-bit core and two 1K by 16 solid state units which can be intermixed in any combination.

Interdata's new Series 70 Processor was another first-time shown product.

Court to Rule on Software Patents

WASHINGTON, D.C. – The Supreme Court has agreed to decide whether software can be patented.

The high court probably won't hear and decide the case before its new term begins in October, but when it does rule only six of the justices will participate. In accepting the software issue for review, the court said Justices Potter Stewart, Harry Blackmun and Lewis Powell won't participate.

The court will review the decision of the U.S. Court of Customs and Patent Appeals which held that software is patentable. The product under review is the Benson-Tabbot program which converts BCD data to true binary [CW, Feb. 23].

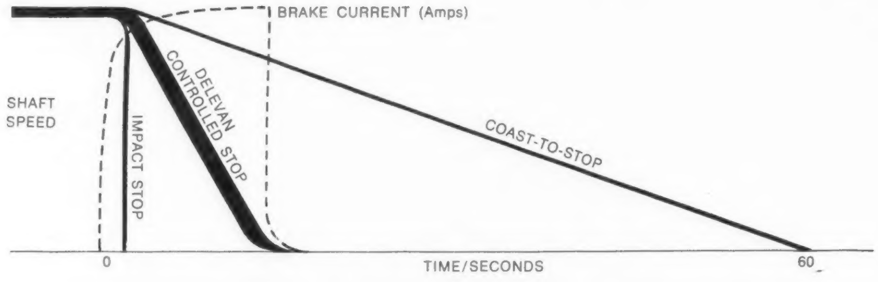
In agreeing to hear the case, the court granted permission to IBM, the Business Equipment Manufacturers Association and the Information Industry Association to file briefs.

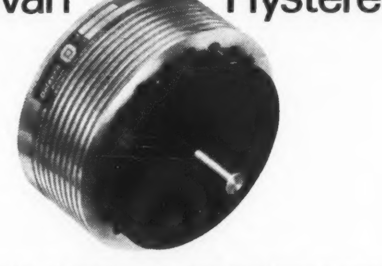
IBM to Maintain Core Users, Awaits Ruling

WHITE PLAINS, N.Y. – "Pending results of the hearings scheduled to start March 2, IBM has decided to treat customers of other memory manufacturers in the same manner as customers of Advanced Memory Systems Inc. and Itel," IBM said.

Letters have been sent to "certain customers who previously had received notice that IBM would no longer attempt to maintain their substantially redesigned CPUs. The letter advises these customers that IBM will continue to provide maintenance savings to the extent that it is able on a best efforts basis until the resolution of the court order," IBM continued.

IBM was issued a temporary restraint order prohibiting its withdrawal of maintenance services from users with Advanced Memory Systems core extensions [CW, Feb. 23].





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EDITORIAL OFFICES: 797 Washington St., Newton, Mass. 02160 (617-332-5606; TWX 710-335-6635). **Europe:** Computerworld, c/o IDC Europa Ltd., 59 Grays Inn Rd., London, W.C.1, England (01-242-8908).

Second-class postage paid at Chicago, Ill. Published weekly (except: a single combined issue for the last week in December and first week in January) by Computerworld, Inc., 25 E. Chestnut St., Chicago, Ill. 60611.

25 cents a copy; $9 a year in U.S.; $10 a year in Canada; Airmail to Western Europe and Japan, $15 a year. Other foreign rates on request. **MARGARET PHELAN**, *circulation manager.* Four weeks' notice required for change of address. Address all subscription correspondence to circulation manager, Computerworld, 797 Washington St., Newton, Mass. 02160.

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CW Forum and Exposition

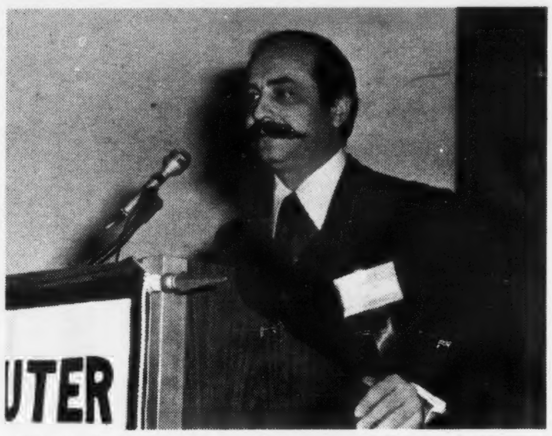
People Meeting People...


Panelists describe their own operations before answering questions from forum participants.


Panelist Robert Chernis of Lumber Mutual Fire Insurance leads a workshop on intelligent terminals.


Lawrence Feidelman discusses data entry.


Dixon Doll answers questions on data communications.



Charles Lecht makes a point on operational efficiency.

Homework Vital to Good Data Entry

BOSTON – The necessity for a systematic approach to data preparation was emphasized by Lawrence Feidelman in the keynote address to the data entry session of the New England Computer Users' Forum.

Feidelman, president of Management Information Corp., contended that although the equipment available has been changing in a revolutionary manner, the processes used have been more evolutionary in nature.

One way to the proper implementation of any input preparation system is "homework," he said. The user must study the methods himself in order to apply them profitably and technological advances should not scare the user.

Feidelman urged the attendees to learn about data entry themselves, and not to let their salesmen be their guides.

Later, at the keypunch replacement workshop, Larry Winship of GTE Sylvania told attendees that shifting from conventional keypunching to a key-to-disk environment can be a difficult operation, for both management and machine operators, but the benefits generally outweigh the problems.

Sylvania's lighting division made the move from 15 keypunch machines to a 12-station Consolidated Computer Key-Edit key-to-disk system about 14 months ago.

Management can have problems when it starts to consider replacing its keypunches if it fails to analyze its situation in detail or if it solicits more proposals than it can reasonably study, Winship said.

Training Period

The training period needed to get even experienced keypunch operators working efficiently on the new equipment is much longer than either he or his keypunch supervisor had anticipated, Winship said in answering questions from the floor.

In spite of these problems, the effectiveness of the key-to-disk devices used by Sylvania can be measured against "hard dollar amounts previously spent for people, machines and cards. The old monthly expenses, running in excess of $9,900/mo, have been shaved by at least $500, even though new applications have been added, according to Winship.

Nowhere was the lack of user expertise more apparent than during the workshop on OCR.

Experienced observers said they were surprised at the low level of technical expertise revealed by the attendees at the workshop through their questions.

The workshop, conducted by Dave Tierney and assisted by Ed Doherty, both of the State Street Bank and Trust Co., was spent in answering basic questions.

One question, for example, was, "Isn't OCR use restricted by either inflexibility or high cost?" Tierney pointed out that OCR was more flexible. The form used as input, the actual data itself, is more recognizable by the person entering it, he said. Tierney said he believed OCR is easier to understand than data from punched cards or some other media.

Thomas Laycock of the U.S. Internal Revenue Service told his workshop on direct data entry that a CRT key entry unit can be up to 7% faster than a conventional keypunch device. He is in a good position to know since he operates no less than 640 CRT devices at his installation.

The Andover, Mass., IRS center switched from keypunches to CRT terminals during the tax return "rush period" last March. Because of the faster input with CRT units, Laycock said more data is now being processed by each terminal. It is therefore difficult to measure the time being saved on each individual tax return.

"But the CRTs have resulted in a 40% cost savings," the IRS speaker said. Some of this savings can be attributed to the fact that 400 million punched cards no longer have to be handled and stored, he said.

Robert Chernis of Lumber Mutual Life Insurance said at his workshop on intelligent terminals that the use of intelligent terminals allows the user to move responsibility for data preparation out of the computer department into other areas of the firm.

By preparing cassettes in the using department, he said, a firm can eliminate errors, since the users of the data are more familiar with their application or particular requirements than the DP department would be.

Users considering intelligent terminals must carefully consider the reliability of the equipment, he said.

Lecht Calls for Serious Study Of Throughput Predictability

BOSTON – The time has come for a serious study of throughput predictability. Computers and EDP personnel now form "gigantic romantic reciprocating systems," but no one really knows how well they are working, compared to what they can do, according to Charles Lecht, keynote speaker at the operational efficiency workshop on the third day of the *Computerworld* New England Computer Users' Forum.

Until vendors and users know what they honestly can expect from their equipment and their programs, they have no way of knowing how efficient they are, he noted.

He hoped the users in his audience would start badgering their vendors of both software and hardware, he said, to provide honest guidelines on the effectiveness of their products.

He challenged IBM to let the users know how it measures the efficiency of its own data centers, if it in fact does do this.

During the core extension workshop, Floyd Nelson of Green Shoe Co. stated the addition of extended core memory to his firm's 360/30 caused some problems, but was worth it.

The addition of the extension core (to 128K), Nelson said, has put off the replacement date of the 30 by at least one year. The added capacity has allowed implementation of an order entry system with a response time of four seconds, Nelson commented.

An alternative to the extension memory had been the acquisition of a large computer, a 360/40, for example, Nelson told the workshop group. This was impractical, in part, he explained, because his company would have lost some $60,000 in tax credits.

At the workshop session on dedicated systems versus general-purpose computers, Bob Bozeman of Zayre Corp. found high interest in his firm's use of System 3s.

Zayre, site of the first installed IBM 370/155, runs a highly centralized DP operation, with the 155 operating on a

(Continued on Page 5)

'User Boondoggled'

Prove Distributed Data Nets Are Viable, Doll Urges

BOSTON – Direct data entry from remote sites is the largest application area for today's computer communications user while remote batch applications are in second place and growing fast.

These opinions on data communications were voiced by Dr. Dixon Doll in a keynote speech during the second day of the New England Computer Users' Forum.

While predicting "substantially increased permissiveness" for the interconnection of customer-provided equipment to the telephone network, Doll cautioned that Bell will continue to fight the direct connection of non-carrier equipment without its "connecting arrangements."

The speaker chided the "computer terminal industry" for attempting to "sell the concept of distributed computing" via communications networks, at the wrong time. The industry will have to prove distributed data nets are economically viable, Doll said. "The vendor must stop trying to boondoggle the user," he declared.

At the workshops following the keynote, Mort Berlan of MIT explained how his installation had benefited from using independently supplied equipment. At MIT five Bell 103 data sets were replaced with independent modems for a savings of $59,000/year. This savings was realized after a 13-month payout period to amortize the non-Bell data sets, Berlan said.

At the dialup network workshops, Ernest Hatcher of John Hancock Mutual Life Insurance told his audience that the Bell system is about the only real source of communications facilities available now. Bell therefore is where most users should start their development of teleprocessing systems.

The traditional communications common carrier can provide transmission capabilities for "any speed you are willing to pay for." But the switched network is not really very good for data since it is an analog system designed for voice traffic, Hatcher said.

Independent Suppliers

Even confirmed users of mainframe and carrier equipment sometimes have to go to independent suppliers, according to Ralph DeMent of United Fruit Co., at his workshop on data communications equipment sources.

"The user has to be aggressive to get what he wants," DeMent said. Most telephone company representatives will not offer information on data facilities or equipment unless prodded, he said.

The data user who decides on independently supplied data equipment can experience difficult maintenance problems, according to DeMent. Most independent suppliers have difficulty in making their units "totally compatible" with IBM or AT&T equipment, he said.

While conceding the average telephone installer "isn't very smart," DeMent suggested users develop a close relationship with Bell foreman since they "can get things done."

At the workshop on data transmission over private lines John DeLuca of First National Stores explained their system is "totally redundant" and is designed to use off-line batch processing, with data captured on half-inch tape. The system uses 9,600 bit/sec modems over private line dial repeated network.

Fifty key stores gather data from the other stores and forward them to four terminals.

The revised system was described as providing twice the throughput at a slight increase in cost. The old system used 2,400 bit/sec modems which, together with line charges, cost $2,130/mo. The new system transmits two lines of data at 4,800 bit/sec each, multiplexed.

Throughput Predictability Needs Much Study

(Continued from Page 4)

batch teleprocessing basis to System 3s in warehouses. It merges central data, swaps messages and delivers report data to the remote sites.

Many users had questions on the System 3's communications capabilities, and seemed interested in Zayre's applications. But actually, the System 3s are very powerful little computers, Bozeman said, and are more than what is needed at some of its sites. The firm is thinking of installing System 7s with scanners, which would act as I/O devices. Bozeman said he was surprised to find some managements had put their own particular applications on the System 3, although the units were installed as "dedicated machines."

Stan Allen of New England Merchants Bank told his workshop on independent peripherals that since most users of independent peripherals shop for price, it makes sense to limit any agreement to a one-year term. This gives the user the flexibility to renegotiate his peripheral contract when prices change.

Allen said the biggest problem area is the maintenance support available from the independent supplier. But some independent support exceeds IBM's, he said.

Another user at the session told of foresaking IBM in favor of independent peripherals only to find "a cooling of IBM support as a result." With the independent supplier, Telex, problems eventually caused his firm to return to the IBM fold, according to Bob Richman.

It is difficult for users to benchmark independent units before they decide, Allen said. But he suggested two remedies. Visits to other experienced users and talking the independent supplier into "a 30-day free trial," can provide valuable operating information, he said.

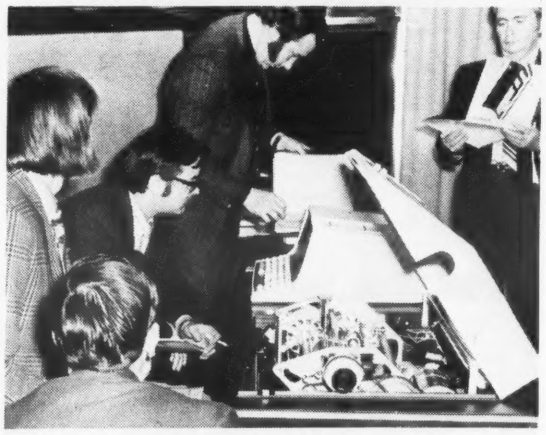
Edwin Hawley, leader of the systems software workshop, believes vendors of systems and utility software should provide much better training and support than they do now. The reliability and stability of the vendors is the biggest single factor limiting the use of commercial packages.

Benchmarking is a vital but thoroughly confused area in the evaluation process, Hawley said. A user shouldn't have to pay to test a vendor's package.

He noted that New England Telephone, as a matter of policy, does not modify software bought from outside sources. Whenever the user does tinker, he runs the danger of disturbing the "convoluted logic of the package" which may have taken years to tune properly.

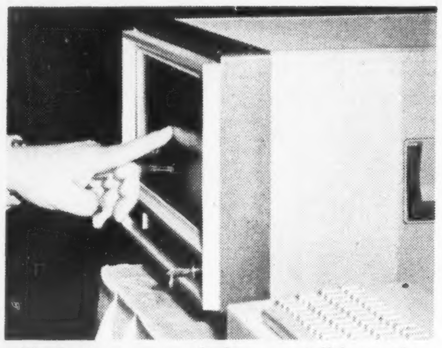
...And the Machines

Graham Magnetics illustrates Epoch-4 tape toughness and graphs the stress strain curve on samples.



Computer Terminal Corp. exhibitors meet some users who "want to see the works."

Cartridge disks are loaded into Iomec's Iodisc Series One data storage system.



No buttons, no switches are visible on the Lockheed Sue Minicomputer. Microflex switches and light-emitting diodes are hidden behind the flexible plastic front panel.

★ CW Photo Feature By V.J. Farmer ★

Users try out Interdata's Series 70 processor.

Calcomp demonstrates its new 1040 magnetic tape system that is plug-to-plug compatible for the 360/370 CPUs.

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NBS OKs Cobol Compiler Plan; Plans Few Software Standards

By Don Leavitt
Of the CW Staff

DALLAS – The National Bureau of Standards has approved the plan it proposed last summer for the classification of Cobol compilers [CW, July 28], but will not have many other standards directly related to software, according to Dr. Ruth Davis, director of the NBS Center for Computer Sciences.

Dr. Davis stated that NBS expected to have some 60 Federal Information Processing Standards (Fips) by the end of the 1970s, but that only a dozen of these would be software-related.

Policing Own Products

Instead of relying on NBS for guidance, the software industry should work towards policing its own products, much as the electrical industry now depends on the Underwriters Laboratory for confirmation of the safety of its products, Dr. Davis also said.

Dr. Davis emphasized her call for better software products by claiming there are 1,000 detected errors in every release of OS/360. She admitted many of these were minor errors and that, compared to an overall average of two million instructions per release, the error level was extremely low.

A formal certification plan, under which an independent group would attest to the design correctness and reliability of a program, and to its performance, would be ideal, in Dr. Davis's view, but probably not attainable at this time.

Validation Procedures

Validation procedures, to determine the extent to which a product conforms to certain stated conditions or requirements, are not as demanding as certification, Dr. Davis said, and are close to being available now. Development of validation, however, depends on prior development of standards, such as ANS or federal Cobol, and the impact of validation can't really be predicted, Dr. Davis added.

In the interim, the industry should work towards a standard set of specifications, so that users can have detailed, precise, explicit written descriptions of what a program does.

NBS federal standard Cobol uses the same nucleus and functional processing modules as ANS Cobol, but defines four distinct combinations of these "building blocks" as low, low-intermediate, high-intermediate or high-level implementations of the language.

A compiler must contain all the elements of its defined implementation level but may include additional elements. When used, these additional elements must be identified and flagged on a source program listing, by the compiler or a precompiler.

Bill Urges Better U.S. DP Policymaking

WASHINGTON, D.C. – "The U.S. must maintain world leadership in computer technology," Rep. Jack Brooks (D-Texas) declared when introducing legislation to improve federal policymaking regarding computers.

"If the U.S. loses its leadership in computer technology – if we become a second-rate computer power – we will become at the same time a second-rate nation, both economically and militarily," Brooks stated.

"Broad segments of our economy and most of the nation's defense systems rely upon computers, and they offer vast potential in the solution of many of the extremely difficult social problems confronting the nation," he continued.

Brooks's legislation "would provide limited funding to the Computer Board of the National Academy of Sciences to provide the highest level of expertise from the nation's computer community to fill the informational needs of government policymakers."

In addition, the bill authorizes federal expenditures of $100 million annually for basic research in computer technology to be administered by the director of the National Bureau of Standards.

The bill also would amend Public Law 89-306 to allow the administrator of general services to enter into contracts for periods of up to five years in the leasing of computers and related services needed by the Federal Government.

"In such areas as East-West trade in computers, the patenting of computer software and matters involving individual privacy and security of information and in countless other areas in which the government has a specific responsibility, the officials formulating the policies and making the decisions need the best information they can get," Brooks concluded.

Aussies Set to Tackle Customs Duty Evaders

By William Scholes
Special to Computerworld

CANBERRA, Australia – Beginning this June, life is going to be harder for customs duty evaders because of the use of a computer system to check all invoices accompanying imports.

Based here, with links to capital cities, an ICL 472 computer will use the post office telephone system to connect state offices to the head office.

A second computer will be installed when the Department of Customs and Excise moves to its new offices in the trade complex now under construction. The system will be able to note the item invoice, refer to its tariff classification, decide what rate of duty will apply, calculate it, and then decide whether the invoice needs further examination. If it does, and about 30% to 40% of all invoices do, it will be passed on to a skilled investigator. The computer will assist the Department of Customs and Excise in more rapidly detecting malpractices and customs evasion by giving investigators all the information necessary to determine whether fraud is evident.

Ohio College Gets 1401

SALEM, Ohio – Students of electromechanical engineering technology at the Kent State Salem Regional Campus are learning computer maintenance and repair from an IBM 1401. The college wrote a proposal to IBM to apply for a 1401 when it discovered IBM was giving 25 of its computers away. The firm liked the application and granted the machine to Salem.

Special Report

Part I

Storage and Internal Processing

'Old' 360s Get New Life From Core Enhancements

Users Depend On Independents For Replacement

By Ronald A. Frank

Of the CW Staff

"Some users really aren't buying anything by spending that extra $5,000/mo on a 145."

Despite the much-heralded introductions of IBM's 370 Series, many users are finding there's plenty of life left in the "old" 360. Never before has so much attention been paid to prolonging the life of installed systems.

Many users faced with a need for additional processing power are turning to core memory enhancements. And in most cases the price is right.

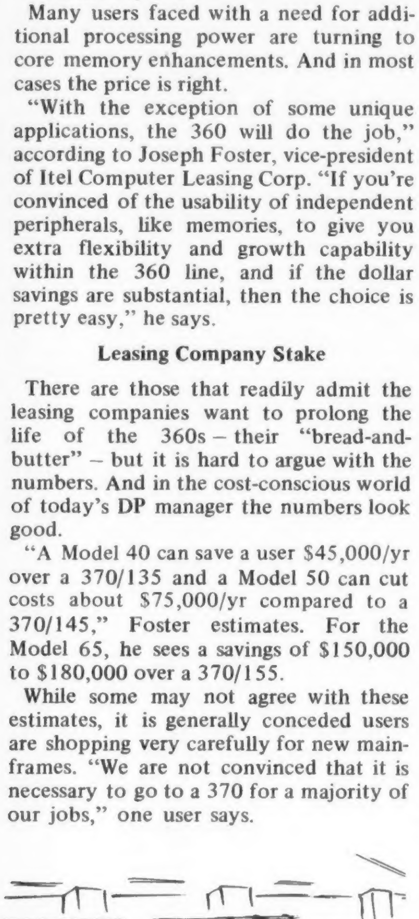
"With the exception of some unique applications, the 360 will do the job," according to Joseph Foster, vice-president of Itel Computer Leasing Corp. "If you're convinced of the usability of independent peripherals, like memories, to give you extra flexibility and growth capability within the 360 line, and if the dollar savings are substantial, then the choice is pretty easy," he says.

Leasing Company Stake

There are those that readily admit the leasing companies want to prolong the life of the 360s – their "bread-and-butter" – but it is hard to argue with the numbers. And in the cost-conscious world of today's DP manager the numbers look good.

"A Model 40 can save a user $45,000/yr over a 370/135 and a Model 50 can cut costs about $75,000/yr compared to a 370/145," Foster estimates. For the Model 65, he sees a savings of $150,000 to $180,000 over a 370/155.

While some may not agree with these estimates, it is generally conceded users are shopping very carefully for new mainframes. "We are not convinced that it is necessary to go to a 370 for a majority of our jobs," one user says.



"Not 'til I've squeezed the last tiny spark out of her will I give up this 360, no way!"

When it comes to increasing the capabilities of 360 mainframes, some Model 65 users have "put it all together." Many are using independent replacements for the IBM 2361 Large Core Store (LCS) that allow them to greatly exceed IBM's cycle times.

The 2361 was originally developed by Ampex Corp. (under contract for IBM) to enhance a 360/75 operated by the National Aeronautics and Space Administration in Houston. But it was a slow device which had a cycle time of 8 msec compared with the 65's 600 nsec.

To merge the high- and low-speed memories into one operating system, IBM developed an interface "black box," an 8080 attachment. The independent suppliers of 2361 replacement units have found a way to modify the 8080 to achieve a cycle time of 1.8 μsec.

"The independents offered us an economic reason to keep our 65," according to Michael Armstrong, assistant director of the Rochester University Computer Center. "A high-speed memory would have been much more expensive. We now have a Data Products box with a million bytes at about $5,000/mo," he says. IBM would have charged about $10,000/mo for each quarter megabyte, Armstrong believes.

Because of its slow speed, the 2361 made the Model 65 perform like a 360/40. IBM specs called for the user to first shift data from LCS memory into main memory to overcome the slow operation of the 2361. "Now with our independent unit we can operate APL jobs with the speed of a 'Model 53,'" according to one user.

Most users of 2361 replacement units have 8080 lease units from IBM. Up to now the mainframer has not objected to the 8080 speed enhancements. "The change is really quite simple," according to Eugene A. Kruschke, ECM product manager at Ampex.

"Many users have jumped on the IBM bandwagon without exploring the capabilities of their own systems. We have demonstrated that with the addition of LCS storage the user's 65 can do his jobs as efficiently as the 370," according to John Guyett, director of marketing for Data Products-Core Memories Inc.

Most independently supplied 2361 users have been content to operate with 1 or 2 million bytes of additional storage, but a few have installed 4 million bytes of Ampex Extended Core Memory (ECM).

One of the largest installations is at Carnegie-Mellon University where four ECMs, each with 1 million bytes, are operating in an interleaved mode on a Model 67.

"There is no doubt that the four million bytes of independent LCS storage have increased the life of the 67," according to Dr. Ronald Rutledge, director of the

(Continued on Page 9)

What Users Say

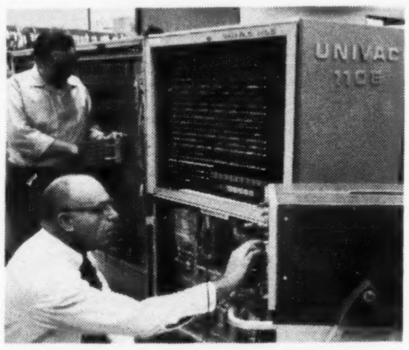
- "With the exception of some unique applications, the 360 will do the job."
- "The independents offered us an economic reason to keep our 65."
- "Many users have jumped on the IBM bandwagon without exploring the capabilities of their own systems. We have demonstrated that with the addition of LCS storage the user's 65 can do his jobs as efficiently as the 370."
- "There is no doubt that the four million bytes of independent LCS storage have increased the life of the 67."

In-House Maintenance Staffs One Way to Take Care of 'Family'

Since there is some doubt as to whether IBM will continue to adequately maintain some altered systems with independent memories, a few users have decided to "take care of their own."

These IBM users with purchased or third party leased systems have decided to train an in-house maintenance staff for their machines. Most mainframe suppliers will cooperate with users to train personnel in proper maintenance procedures. But at least one user says it has been more difficult to develop an in-house capability to maintain IBM systems.

"After your initial run-up you get better performance from your machine because you have the same people working on it."



Carnegie-Mellon University has its own in-house maintenance staff. Here the 1108 is getting a periodic check-up.

At Carnegie-Mellon University in Pittsburgh the computer center operates with Univac, DEC and IBM CPUs. The biggest problem in training people to maintain the equipment involved IBM, according to Dr. Ronald Rutledge, director of the center.

'Tussle With IBM'

"We have had quite a tussle with IBM about our maintenance," Rutledge says. "They quoted a rate of $600/day, and this would have meant tying up our machine for four hours per day." When Rutledge told IBM the price was unreasonable, the supplier said it had provided a means to accomplish what the university wanted.

"IBM has a tight monopoly and they have set things up so it is really very difficult, if not impossible, for the average user to get the required capability for maintenance from IBM," one large user says.

Marketing Ploy?

Some see IBM's reluctance to offer training to in-house people as a marketing ploy. These users point out that even the "third party maintenance" companies are limited to the more populated geographic areas. This makes many users dependent on IBM, they say.

But an IBM spokesman disagrees: "IBM will provide training to any person who maintains IBM machines and programs."

As part of its service engineer training program, IBM said it will provide training at either the customer's site or an IBM-provided facility. "When IBM does not have an installed system of the proper type, training will have to be conducted on the customer's equipment," the IBM spokesman said.

The company would not quote any prices, stating "cost varies according to the size of the system, the configuration, size of the [training] class and location."

'Own Family'

The advantage of in-house maintenance is that "it's your own family," Rutledge says. Normal 40 hour-a-week maintenance coverage from IBM is about 12% of total systems costs that can be saved, he believes. "A small 67 configuration costs about $60,000/yr under IBM maintenance," Rutledge says, "and for that kind of savings a user can build up a significant in-house maintenance staff."

None of the mainframe suppliers really give the user the type of maintenance that he should get, Rutledge says. He has also been instrumental in forming an in-house maintenance committee with the IBM Share users group.

Enough Work

Rutledge says a user can cut his maintenance costs in half if there is enough work to keep two persons busy. But at Carnegie the maintenance staff was recruited from technicians in an electronics repair shop, so no one is assigned full time to maintenance but is available as needed. "You can't lose money and you may save a lot," Rutledge adds.

"After your initial run-up you get better performance from your machine because you have the same people working on it. So performance improves instead of deteriorating with age." The user also gains a hardware knowledge that makes it easier to implement upgrades and the addition of independent peripherals.

"It's nice to be self-reliant without having to depend on the manufacturer," Rutledge concludes.

Price War Benefits User

Independents' Add-On Core Cuts Bills

"If the user shops around, he can usually do some good bargaining for add-on memory."

"IBM sells reliability, modularity, and serviceability as the key advantages of their semiconductor 370s . . . We can offer users those same advantages on the 360."

Most 360/30, 40 and 50 users considering additional memory capacity talk about add-on core which is available from independent suppliers at 10% to 50% cheaper per month than IBM.

The independents normally don't claim any performance advantages over IBM's native core, but they stress the cost savings. "There's a price war being waged by the independents," one industry source said. "If the user shops around, he can usually do some good bargaining for add-on memory."

"For a large amount of core over a long-term lease, the user could save up to 50% over IBM rental prices, according to William Nimee of Cambridge Memories Inc.

Other independents are more conservative, however. Most firms that offer add-on memories say they can offer users about 20% savings.

One of the first add-on core units was installed early in 1970 on a 360/30 using Data Recall memory, according to Roger Goetz, vice-president of Computer Investors Group. The company supplies Data Recall memories for both leased 360 systems and end users.

'Inherently Reliable'

The memories are "inherently reliable" and there are cases of core add-on units running "for a year without any downtime," Goetz says. Although most core units require little maintenance, the Data Recall devices include a "memory exerciser" to perform testing, he says.

There are a few unusual options related to choosing add-on memories. At least one company, Advanced Memory Systems Inc., can supply semiconductor memories for 360/22 to 360/67 users.

These semiconductor add-ons give the 360 user "a 370-type memory," according to Robert Lloyd, the firm's president. The new memories also provide 370-type "error correction" features which are not available with core memories, Lloyd says.

'20% Savings'

The semiconductor memory user can "easily expect a 20% savings" over IBM, according to an Itel spokesman. Itel supplies the Advanced Memory semiconductor memories to users.

"IBM sells reliability, modularity and serviceability as the key advantages of their semiconductor 370s," Lloyd states. "We can offer users those same advantages on the 360."

While the addition of core is not a new concept, some users are looking further and replacing core. To do this the user takes off as much core as IBM will allow and replaces it with independent core to get a bigger monthly savings.

IBM will allow users of rental systems to replace native core so long as they stay within "basic system" limits. Some observers say IBM wants some native core capacity so its field engineers can run diagnostics on their own – instead of independent-storage.

Breathing New Life Into the 'Old' 360s

(Continued from Page 8)

Carnegie-Mellon University computer center. Before deciding to increase the Model 67's storage, the university explored the acquisition of several other systems from IBM and other suppliers.

"But there wasn't a clear easy conversion path to any machine," Rutledge says, "some machines might have been better than the 67 but the phase-over cost was too high. The user has to keep his machine as long as it is cost effective."

With a system that is substantially LCS bound using the IBM 2361, it is not hard to double the overall performance with an independently supplied extended core unit, the director believes.

At Rochester University, the IBM OS was closely scrutinized to see whether it had to reside in high-speed native core. "You get to play a whole new game with hierarchical memory, Michael Armstrong says. The entire linkpack area of OS and the master scheduler were moved into the slower speed 2361-type memory at Rochester. While this made some portions of OS somewhat slower, the big advantage was "freeing up slightly over 100K" of high-speed 65 storage to run user jobs, Armstrong says.

Recognizing a trend toward more efficient utilization of available core at independent 2361 installations, Ampex has introduced its ECM management program, which could increase throughput up to 15%.

The Mercantile Safe Deposit and Trust Co. in Baltimore recently decided to add a leased 360/50 to its installation. The decision was made after careful evaluation of both 360 and 370 CPUs. The bank now has a Model 40 with 196K of core.

"We started out to be as objective as possible about our next configuration," says Joseph Di Guardo, vice-president for data processing.

The Mercantile bank looked at a 370/145 from both IBM and third party lease suppliers. Also considered was a 155, "but the economics were just not right in any of these situations," Di Guardo says.

Last fall the Mercantile bank began a program of evaluation and benchmarks that lasted several months.

The Model 50 produced a 35% improvement over the Model 40 and, surprisingly, the "145 gave about the same performance as the 50," Di Guardo says. "Some users really aren't buying anything by spending that extra $5,000/mo on a 145," is the way one user described a similar evaluation.

The Model 50 with 512K of core is due for delivery this month and some observers believe the bank will save about $60,000/yr compared with a 145.

Editorial

Erasing the Line

Without fanfare, Hewlett-Packard last week erased the fine line between programmable calculators and general-purpose computers.

Granted its new HP 9800 Model 20 calculator was already an extremely powerful and versatile machine. But somehow it came across as a super calculator, not a minicomputer.

The company then announced an interface that permits the 9800/20 to act as a system controller for data acquisition, process control and automatic testing.

We suspect the 9800/20 is the prototype of that long-awaited machine — the desktop general-purpose computer that almost anyone can program.

Only IBM Will Benefit By Dropping DOS: Kert

By Kenneth Kert

Special to Computerworld

Viewpoint

With all the discussion about DOS support being dropped, the advent of the 370 and the cost of converting to and running OS, I think it is time someone set the record absolutely straight.

Bear in mind that thousands of IBM marketing personnel will deny these assertions (some will even believe them to be untrue), but facts speak for themselves, especially facts borne out by historical precedent.

I maintain IBM has always used its "free" systems software to sell its hardware, and that recent developments are very consistent with this strategy.

For example, ask yourself why IBM should care if its free software (Power, for example) gets replaced by an independent package (in this case, Grasp). It represents no loss of IBM revenue, and it's a maintenance, training and documentation headache that can be eliminated.

IBM should be very pleased to have a user replace Power with Grasp, and yet it's not.

Could it be that the "free" package, which consumes core and disk on a massive scale, which runs much slower than it should, and which manages to use up one of only three partitions available to the DOS user, actually forces hardware upgrades before they would otherwise be necessary?

Make Sense

With this in mind, IBM's DOS strategies make much sense. That OS has a number of useful and attractive capabilities is an accepted fact. What is largely accepted but seldom questioned is that DOS cannot have these capabilities.

Independents have added an impressive list of enhancements to DOS at little or no cost of core, including the most popular OS features – automatic spooling, additional partitions, load libraries (relocatability), time-slicing (partition balancing) and Proclibs, to name just a few.

These capabilities increase throughput from existing hardware, so there is no reason to expect IBM to provide them. To get these capabilities, they say, go to OS and buy more hardware in which to run it. Dropping DOS support is a convenient way to avoid the growing pressure to include these capabilities in DOS.

No Enhancements

It is important to realize that the dropping of support per se is relatively unimportant. There is no doubt but that Release 26 of DOS will be virtually bug-free by March 1973. What is important is that no further enhancements are going to be made to DOS for 360s.

The implication is that, except for additional device support, no additional capabilities will be available for 370 DOS either. (It would be much too easy for the independents to convert any enhancements to 360 DOS.)

So it all fits into a neat pattern. To get better software, pay IBM for the hardware to run OS; but if you want a 370 and can't afford $250,000 or more to get to OS, you can run 370 DOS.

Who loses? The leasing companies, with a huge 360 inventory that stands to be obsoleted by a software strategy. What can the user do? Look to the independent systems software companies. There are many ways to get more performance out of a 360 or a 370 at less cost than buying hardware.

As an IBM stockholder, I must applaud their strategies, past and present. The revenues and profits continue to climb. As a competitor, I am awed by the ease with which IBM pulls off these moves. If I were a user, however, I would start looking around. The worst is yet to come.

Kert is vice-president, marketing, for Software Design, Inc., El Segundo, Calif.

Letters to the Editor

Managers Who Know Little About People

I was interested in the article by James L. Scott [CW, Feb. 2] on the woes of men in management who have come to their present positions through technical expertise, but who know very little about being managers.

I was interested because I work with just such men. They know all about machinery, about electronics, about EDPs, etc., but they know very little about people. They know very little about the complex world of interpersonal relations; they know very little about comporting themselves with men on their own managerial level. Some of them imagine that the ability to communicate with others is something which comes naturally. It is not; it has to be learned.

I am a practicing speech consultant and my students are individuals and groups on the executive level. Most of them are mature men in their forties and fifties who have discovered that they suffer from a frightening lack of the knowledge necessary to survive in the highly competitive management field.

One, whom I will call Executive No. 1, was endearingly naive. When a colleague would ask him a loaded question designed to prove how loutish is Executive No. 1, the good-natured man thought he was being asked for information, and could be drawn off into endless discussions that wasted everybody's time and proved the colleague's point. Executive No. 1 no longer suffers from this naivete, and can defend himself adequately from this sort of attack.

Executive No. 2 does not know how to organize a report for oral delivery, or even the basic techniques of delivering a report, reading aloud from manuscript and displaying visual aids. Executive No. 3 has a strong regional accent which actually impedes communication because his colleagues are listening to his accent instead of to him. Executive No. 4 makes gestures – rubbing his nose, pulling his earlobe, covering his mouth with his hand, or smacking his lips when he speaks – which have become the subject of cruel parody.

I feel for these men; as my experience with them grows, my sympathy grows. I can also make a suggestion to them: training in speech communication in interpersonal situations and in public address would be of significant value to them in overcoming some of their problems.

Dr. Pearl Wiesen, PhD
Brooklyn, N.Y.

CDP Exam Sections May Be Too General

A shared thought concerning the current discussions on the CDP.

I have taken the examination one time. My goal was to pass two sections so that I would not have to retake the entire examination. Having two degrees in management and five years' experience in teaching computer and management science, I chose the sections on management and quantitative methods. I did pass two sections, the wrong two.

Why did this happen? Was there error in my logic or some other consideration? I feel the management and quantitative sections are too general and that a person with a detailed knowledge of these areas is handicapped. Most people who sit for the examination are hardware and software oriented. This could be why these two sections are rather general.

Perhaps this is why the accountant twice failed the quantitative section [CW, Feb. 9].

I hope he and others will be reassured by these thoughts. I think these two sections should be beefed up before any serious consideration can be given to the CDP.

Richard Booker
Training Consultant
Systemation, Inc.
Colorado Springs, Colo.

Variation on a Digit

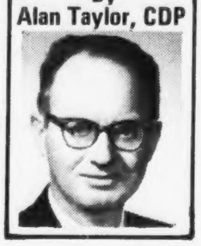
Referring to your article, "Variation on an Old Theme: Man Replaces Computer" [CW, Feb. 9], I would like to take the liberty to point out that a reduction of 900% is logically impossible because it would result in a negative number. My assumption was that you meant 90%, but there is no way for me to tell if the error was logic or typographical.

John N. Petroff
St. Paul, Minn.

It should have been 90%. Ed.

Attack on Magnetic Tape Reliability Spearheaded by SCDP Committee Head

The Taylor Report
By
Alan Taylor, CDP



Don Collins is not a name many of you will have heard of, unless you happen to be in Shelbyville, Ind., where he works for KCL Corp. Over the past year, however, I have acquired considerable respect for the brain behind the name, and was not all that surprised when, as chairman of the Society of Certified Data Processors Technical Committee, he led a new, and, I believe, effective approach to the problems of user technical standards.

He was working on technical standards – the result of an internal society vote at the end of last year which decided the society should concentrate some of its efforts there.

Collins noticed the society was not on very solid grounds to begin with since it did not know many of the facts. A number of our vendors claimed to have facts which proved this or that, but when asked for details, they were inclined to say the tests were proprietary and the society was as much in the dark as before.

So Collins's approach was to find the facts.

At the same time the Tape Users Center in Boulder Valley informed the society it also was rather ignorant about the facts regarding magnetic tape and magnetic tape drives. Collins started work on this area accordingly.

First Tests Completed

The first set of tests has now been completed. They have been monitored by professional engineers, and were concerned with what a new tape really looked like. To do this, a series of new reels of tape was obtained from many manufacturers, and put through some tests, the flaws noted and later categorized.

It was first expected these tapes had no errors, that they were in fact error free. This was particularly so according to the standard adopted – an error would be called an error only from the point of view of the standard tape drives, rather than from the point of view of the official standard. The tape drives are considerably more forgiving than the official standard and this will decrease the number of errors noted.

The results were eye opening. Collins found tapes with 20 to 30 errors on the first pass. But he discovered these were not the worst tapes, but some of the best ones. Others had 50, 60, 70, and over 100 errors!

The next question in the test was how many of these errors were from poor preparation of the tape either at the manufacturer, or else at some other time prior to mounting on the tape reels.

Collins had the tape run five times, the cleaners down, and noted what happened to the errors – how many of them stayed where they were, how many of them vanished and how many of them appeared for the first time.

Don Collins (left) is SCDP chairman of the Technical Standards Committee, and Walter Wilson III is an SCDP consultant who performed the actual tests.

Again results were quite dramatic. Errors now decreased, and in one case there were no errors on the tape. This indicated a considerable amount of pre-preparation on computed tapes, despite all the claimed improvements in binders. This also indicated an installation would be well advised to treat new tape as "green" tape in the same way videotape users find it necessary to treat their tape.

(Incidentally, it was disturbing to note the only tape that had zero errors quickly in the first set of tests, although made in the U.S., was made by a subsidiary of a foreign tape maker.

Significant Differences?

The next part of the analysis was to see whether or not there was a significant difference between the tapes. Collins analyzed the area of flaws involving debris and flaws involving the surface. It turned out the different types of tape had definitely different characteristics – some with much debris and few surface problems, others behaving differently.

One mystery occurred when it was noted that one edge of the tapes seemed to have a lot more flaws than the other. Why this is so is not currently known and is one of the questions the society will shortly ask the various tape manufacturers.

This is the next step. It is good to know what the facts are, but only as a step towards action. Obviously better quality tapes are wanted. Error-prone tapes are just not worth it. It is very good of the tape manufacturers to offer bargains in error-free tapes, but only if they genuinely are error-free in use. And so the next step will be to take this matter to the manufacturers, and perhaps to determine a program of repeating the tests.

It is a new approach to the problems of getting standards that are useful to the users, and getting user benefits out of standards. It may seem unusual that it has taken so long before anyone started measuring these items from the user's point of view. But this is one of the achievements of the Society of Certified Data Processors, and, I think, an important achievement.

If you also believe it is useful to have such data available, please help Collins in his selection of the next set of work for his committee by filling in the questionnaire on this page. If you would like to help support the whole project by joining, or being associated with the Society of Certified Data Processors, please indicate this on your form.

Sample Analysis of Individual Tape Brands

Brand	
A	Perfect for signal strength, 66% above average intrinsic tape quality; 23% above average for error-causing debris; 64% above average for smoothness of tape surface; 23% above average in preventing error-causing debris; and 19% above average in initial tape cleanliness.
B	Perfect for intrinsic quality, with no errors unmoved after four cleanings (some other errors did appear); 33% above average in condition of tape surface, an average amount of initial cleanliness. This had 15% worse than average in debris control.
C	An average signal strength. However, it was 61% worse so far as cleanliness was concerned; 75% worse on its surface condition; 80% worse regarding the debris found; and 220% worse in intrinsic quality.
D	Forty-three percent better in cleanliness, and average in signal strength. However, 57% worse in intrinsic quality; 58% worse regarding the debris noted; and 145% worse in surface condition.
E	Fifty percent better in debris control; 45% better in surface condition; and 37% better in intrinsic quality. Average as far as cleanliness and signal strength are concerned.

This is the information which can be derived from the tests performed for the SCDP Technical Committee. The question is: Would such data help the user select magnetic tapes in today's marketplace?

Survey of Professional Opinion On Tape Condition Data Usefulness

The type of analysis which can be provided to a tape user from the current set of tests would be as shown in the box, "Analysis of Individual Tape Brands." After reading this, indicate whether this type of information has value for you, if published as is, or if published with the brand names disclosed.

Without Brand Names
No Value Little Value Great Value

With Brand Names
No Value Little Value Great Value

In the future there are a number of different tasks which the committee could tackle. Among these, finances permitting, are:

Testing Tape Wearing Qualities.
Testing Tape Drive Characteristics.
Testing Disk Pack Qualities.
Documenting Tape Problem Incidence.
Documenting Disk Problem Incidence.
Repeated Testing and Publication of New Magnetic Tapes.

Please indicate which two of these activities would provide most value to you. ____________________

What other guidance or help would you offer to Don Collins and his committee? ____________________

____

Name ____________________ Address ____________________

☐ CDP? ☐ SCDP? ☐ Interested?

When completed, please return to Don Collins, SCDP Technical Standards Committee, c/o ***Computerworld,*** **797 Washington St., Newton, Mass. 02160.**

Who Cares About Saving?

Taylor Thoughts

There are other interesting cases besides the one involving the loopholes through which IBM continues supplying peripherals to U.S. Government agencies, despite the replacement campaigns supported by the General Services Administration, [CW, Feb. 2].

The whole idea of the operation is to save the taxpayer money. GSA, and its watchdog, the General Accounting Office (GAO), have nothing particular against the IBM peripherals, except that they are more expensive than needed to perform the job. But sometimes, they will tell you, there are reasons which justify the additional expense.

GSA Justifies IBM

One such case a GSA spokesman specifically raised to explain this particular possibility concerned a defense agency which has its computer at some secret site, and has it maintained by government personnel. It therefore believed it had to have IBM equipment, because this was the only equipment on which the men were trained.

This totally justified the additional expenditure, according to GSA.

It is a pity perhaps that someone had not looked a little further. True, it may be GSA's function to look only into the proper handling of the paperwork, but one would have thought someone, perhaps the Treasury Department, because it is involved in taxpayer dollars, should also consider whether any unnecessary expense was involved.

In fact, there was unnecessary expense. What happened was that there were two possible sources for the equipment. It could either be equipment that had just been replaced by another agency, or else equipment which was government owned and available for replacement.

The defense agency concerned – the Air Force – was quite happy to accept the equipment from either source. Taking it from government-owned equipment, and then replacing it with independent drives, would have saved money for the government – but unfortunately the agency that owned the equipment, although quite prepared to work with independent drives, was not in the slightest interested in performing the appropriate paperwork.

Not even to save taxpayer dollars. After all, its budget was not involved.

One might have thought the Treasury would be interested in cases like this, but I am inclined to doubt it. The Treasury was the agency concerned!

The Professional's Viewpoint

CDP Exam Policies Not Supported by the Profession

The number of ballots in the recent Survey of Professional Opinion – over 300 – showed an unusually high degree of interest – certainly sufficiently high to demand effective action on behalf of the profession.

Particularly noticeable is the fact that neither of the recent policies of the DPMA Certification Council regarding the entry to the examination – either before or after last year's degree requirement change – is supported by the profession. In fact, one of the respondents sent in the results of an earlier poll on the matter taken by a DPMA chapter. His letter is particularly interesting and forms a challenge for action.

Results of Professional Opinion Survey

- DP education should, and non-relevant education should not, be counted as experience needed to qualify for entry to a CDP examination.
- A broad background should be favored over specialization, but a specialized examination in addition to a broad examination is looked on with favor.
- The examination, rather than the entry requirements, should be used to determine candidates.
- The examination should be continuously revised in the future, to keep up to date with current technological requirements.
- CDPers are significantly less satisfied with the examination than non-CDP holders.

Some interesting points came from R.F. Littrell, who had objected to DPMA's policy of encouraging people to take the examination as soon as possible, because it will become more difficult in the future. He provides a list of criteria he feels the examination should pass.

A comment from Arthur F. Kaupe Jr. characterized the whole argument as a "tempest in a teapot" until the objectives of the examination are clearly known. He and a number of others pointed out the objectives should simply show qualification.

A call to action came from Nelson J. Cyr, assistant editor of the Los Angeles DPMA Chapter publication. His point was simple – we've been here before.

Well, the Society of Certified Data Processors hasn't been here before. Next week it will make its suggestions as to what action can be taken. But first, read the opinions of other professionals, and think about them.

The Professional Viewpoint Page is produced by the editors of *Computerworld* in cooperation with the Society of Certified Data Processors.

What Is Being Done?

Regarding the CDP Examination, some criteria of good measuring instruments are:

- Administrative ease (method of scoring, item difficulty, ease of interpretation of scores, etc.)
- Reliability (the tendency of the instrument to yield the same results when it is administered to the same group of people more than once).
- Validity (how well does the instrument measure what it is supposed to measure).

Does the CDP Examination meet these criteria? If not, what is being done to assure that the examination ever will meet the criteria of a good test? – R.F. Littrell, Raleigh, N.C.

CDP Exam Not Valid

Not having any confidence in the significance of the CDP Examination, I do not expect to apply for a CDP or to use possession of a CDP as a criterion for employment. However, this lack of confidence is not directed at the principles involved but rather at the validity of the test.

As a "computer specialist" with 14 years' experience who has worked closely with behavioral and educational psychologists, I can, and do, accept the concept that a test can be designed which reliably (i.e., with an acceptable margin of error) distinguishes between the competent and the incompetent "data processor."

On the basis of information available to me, I cannot accept the current CDP Examination as being such a test.

Merely to ask the question whether the CDP Examination should be made more difficult is in itself evidence that the examination has not been properly defined, if only because its objectives are not clearly defined. The degree of difficulty is, properly, a function of the objectives.

Until there exists a clear statement of the objectives of the CDP and until it is clearly demonstrated that the CDP Examination does indeed separate the wheat from the chaff with respect to those objectives, the whole issue is a meaningless "tempest in a teapot." – Arthur F. Kaupe, Jr., Waco, Texas.

We've Heard It Before

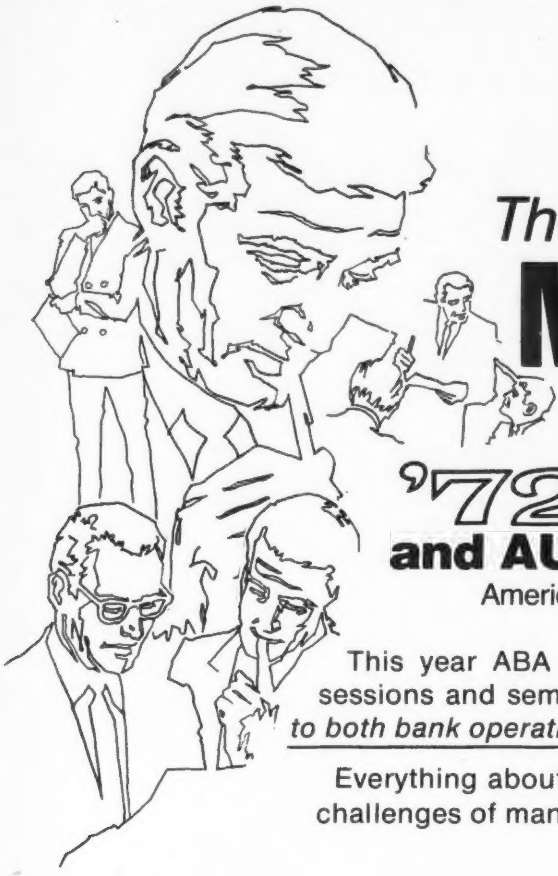
Regarding your present efforts to once again change the CDP entry requirements. I can't help but feel "we've been through all of this before . . . "

For months in 1970 and 1971 many of us worked long and hard to get DPMA to rescind the overly restrictive CDP degree requirement. After much work, DPMA responded by rescinding the unpopular requirement and, instead, changed the requirement to five years' experience – again with no provision for substitution.

My gosh, all we wanted was either/or . . .

I've said it before and, I'll say it again – let's be fair to all concerned in the industry.

Let the exam be its own qualifier – Nelson J. Cyr, Los Angeles.



Random Notes

Utilization Evaluator Improved in Version 3

CUPERTINO, Calif. – Boole & Babbage has announced an expanded and improved Configuration Utilization Evaluator line. The CUE-version 3 quantitatively evaluates the overall performance of the computer system by measuring the execution activity of the CPU, channels and devices during a specified time interval.

Version 3 is an improvement over version 2 in that it has expanded the ability to point to suspected areas of contention. The reports are more comprehensive than in version 2, yet are improved in their formatting and visual displays, according to the firm.

Version 3 may be purchased, for a base price of $8,800, or leased from the firm at Corporate Headquarters Vallco Park, 18990 Homestead Road.

RMS Unbundled by Module

NEW YORK – Brandon Applied Systems, Inc. has changed the pricing procedure on the firm's Resource Management System (RMS). RMS, a comprehensive system comprised of two component subsystems – Operations Control and Project Control – is available for IBM and RCA third generation computer users.

Users are now able to acquire RMS by program group to implement management planning and controls systematically by area. The firm is at 1611 N. Kent St., Arlington, Va. 22209.

TOS Developed for Novas

BELTSVILLE, Md. – Computer Operations, Inc. has developed an operating system for the Nova series minicomputers. Based on the Linc Tape drive, the Linc Tape Operating System (LTOS) provides Nova users with a source text editor, an assembler, several loaders and a group of file handling utility programs.

LTOS can be used in any size Nova 4K or larger. All files are assigned and called by a six-character name. The user is not required to remember specific tape addresses or program lengths.

LTOS is supplied without charge on all Nova/Linc systems. Linc Tape is plug compatible with the Nova and is available in single drive and dual drive configurations priced at $3,950 and $7,350 from 10774 Tucker St., 20705.

DOS Has Come a Long Way in 6 Years

By Don Leavitt
Of the CW Staff

DOS/360 users have had to make a lot of adjustments over the years, in their operating procedures and in their expectations of what the system software can do for them.

There have been 26 releases of DOS in the six years since it first appeared. Changes from release to release were often relatively minor, but even IBM recognized three distinct breakpoints, or "version" changes in the 360 support, even before the changeover to 370, and the start of version 4, effective with Release 27 this May.

Now that IBM has announced the "functional stabilization" of DOS for the 360, many users will be glad to get off "the memory-go-round of revisions" and settle down to getting the most out of DOS as it is.

The first release supported a single job stream in a batch processing mode. In effect, it was an updated replacement for the Input/Output Control Systems (IOCS) used with the 1400 Series CPUs.

It supported assemblies and compilations, including the organization of core image and other object libraries. With these it controlled job-to-job transfer and required a 16K memory, and the supervisor took 6K bytes.

Five months later, the availability of fixed partition and single program initiator multiprogramming modes marked the start of DOS, version 2. Now the user had three partitions each of which had its own job stream. SPI allowed the use of one background batch-processing stream while two operator-started jobs were being handled in the foreground.

Batch job foreground processing was released in April 1968 and let the user run both a foreground and a background batch-processing job stream, while the operator initiated jobs in the other foreground partition. Used in that mode, DOS required 32K bytes. When three batched job streams are run in "true" multiprogramming operations, the minimum machine size is 64K.

The system does not support the swapping of jobs between partitions so that they can utilize available system resources – and that is the major limitation of DOS in the eyes of some observers. Though stronger than it was, it is, basically three copies of the original system running concurrently, but very nearly independent of each other.

'Reprieve' Puts IBM DOS on Spectra

HADDONFIELD, N.J. – Two programs from National Information Systems Corp. (NIS) allow users to run IBM 360 software on RCA Spectra equipment or to run Spectra programs on IBM CPUs, without reprogramming.

The Reprieve package provides I/O interrupt routines so that RCA's TDOS or DOS can be used on "any" 360 or 370. Exodos, on the other hand, allows the use of IBM OS under either MFT or MVT or DOS on Spectra or RCA 2 mainframes.

In either case, the use of a "foreign" hardware environment is transparent to the application programs being processed and to the Job Control coding already in use, according to NIS.

IBM will furnish its operating systems to a Spectra or any other non-360/370 user for a one-time "distribution charge."

While Reprieve provides an easy way to convert from RCA to IBM hardware without a heavy reprogramming effort, Exodos may prove the more useful of the two NIS packages. Most software on the market today was written for the 360. Now these packages as well as ones written specifically for the RCA environment can be considered by Spectra users.

Exodos and Reprieve reside in approximately 22K bytes of upper memory on their respective CPUs. Each is available on license agreement for $800/mo plus an installation fee of $1,200. NIS is at 9 Tanner St., 08033.

Enhanced, Time-Shared Mark IV Available on National CSS Net

CANOGA PARK, Calif. – The Mark IV file management system is now available on a nationwide time-sharing network through an agreement recently signed by the Mark IV vendor, Informatics Inc., and National CSS Inc. of Stamford, Conn.

The new service, Mark IV Authorized Remote Service (ARS), should provide the full capabilities of Mark IV to develop data base applications and for updating, processing and retrieving information from data files in a remote access, on-line environment.

ARS facilities are based on the Mark IV/260 processor and a range of special features, including table lookup and Indexed Coordinated files.

Text processing and resource optimization, version 1, are included in the National CSS implementation and the extended reporting feature is expected shortly, along with version 2 of the resource optimization module.

The time-shared Mark IV is said to be identical to the packaged system previously available.

Cost of Mark IV ARS is based on actual usage, with an initial fee of $2,500, for those subscribers who are not current users of Mark IV, to cover training and support needed to get the system off the ground.

Informatics is at 21050 Vanowen St., 91303.

Package Aids Supermarket Sales

DAYTON, Ohio – A management information system designed to improve shelf space use by supermarkets – the Computer Optimization and Simulation Modeling for Operating Supermarkets (Cosmos-1) – is now available from National Cash Register Co. for NCR or IBM processors.

Developed jointly by NCR and the National Association of Food Chains (NAFC), Cosmos-1 has improved profits for users in pilot installation by 15%, according to NCR.

The Store Report produced by Cosmos-1 indicates the direct profit of each shelf item and also defines which items should be given preferential treatment and which should be dropped.

The system uses a mathematical model for each store of a chain, and order billing information constitutes the data base for the calculations.

The Cosmos-1 software is written in Cobol and operates on an NCR Century 200 or on a 32K 360/25 or larger CPU under DOS. Cosmosis priced in relation to annual sales volume of the user and is available only to "end-user" supermarket chains or companies, NCR said.

Further Study

4 Bell Tariff Plans Suspended

By Ronald A. Frank
Of the CW Staff

Communications

WASHINGTON, D.C. – The Federal Communications Commission has suspended four AT&T tariff proposals for 90 days pending further study. The four proposals include an increase in private line service terminal and installation charges [CW, Dec. 22]; a decrease in Bell 201 data set rates [CW, Jan. 19]; changes in AT&T Data Line Concentrator services to allow multiplexing without the use of a concentrator; and higher rates for some Data Access Arrangements (DAA)s.

The FCC action may have been prompted by the latest objections filed by the Independent Data Communications Manufacturers Association (IDCMA).

The IDCMA proposed to the FCC that "all four [issues] be combined into [one] proceeding."

"AT&T can and does . . . penalize customers who use data equipment supplied by other manufacturers. These policies are not in the public interest," IDCMA said.

'Interim Solution'

The association called on the FCC to require that all data equipment, AT&T and independent, be interconnected through the same connecting arrangement as an "interim solution." The group also suggested "prohibiting devices such as DAAs which were described as badly designed and creating unnecessary technical and economic harm.

The AT&T tariff proposal for data line concentrator service would include the installation of multiplexers at customer sites. Previously AT&T has provided multiplexers only in conjunction with data concentrators. The proposal also would include 75 bit/sec service in addition to the previously available 150 bit/sec service.

AT&T has said that IDCMA's objections to the Bell multiplexer proposals is an "appeal for protectionism." The fact that IDCMA may disagree does not constitute grounds for suspension of the "tariff revisions," AT&T said.

GE Urges Policy Panel to Resolve Interconnection Issue

WASHINGTON, D.C. – GE has told the Federal Communications Commission that a policy guidance panel of communications experts should be established to resolve the interconnection problem.

Citing various advisory committees working in areas such as PBX automatic dialers and answering devices, GE said common issues are involved.

The GE position was contained in a letter sent to the FCC by Jared S. Smith, manager of data networks operation. "We would like to look forward to a timely resolution of interconnect matters [so that] . . . . . truly economic alternatives for the public user" of the telephone network can be developed, the letter said.

GE said "members of this group should have in-depth experience in data, transmission, systems, switching, economics and/or regulatory matters . . ." The group should include users, common carriers and representatives of industry and government, the GE letter said.

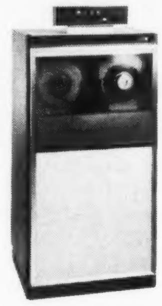
The GE statement was presented at the first meeting of a new interconnection advisory committee established by the FCC to set standards for the interconnection of dialers and answering devices. The committee was formed after AT&T refused to comply with an FCC staff request that would have allowed more liberal interconnection of these devices.

Multiplexer Handles 128 Data Channels

CANOGA PARK, Calif. – American Data Systems has a time division multiplexer that can handle 128 low-speed data channels. Operating on six voice grade lines the ADS 670 can intermix data speeds from 64 to 1,200 bit/sec.

The 670 can be configured to communicate with as many as six other 670 multiplexers to reduce costs, according to ADS. Up to 64 1,200 bit/sec channels can operate with the multiplexer or up to 128 channels can be handled at lower speeds.

The basic unit costs about $2,250. Interfaces for EIA devices are priced at $165/channel. A typical system would cost about $350/channel, a spokesman said. The firm is at 8851 Mason Ave., 91306.



Bits & Pieces

Keystation Number Raised on Entry Systems

LOS ANGELES – Computer Machinery Corp. has increased the capacity of its CMC-5 from 12 to 16 keystations. The record storage capacity of the CMC-5 has also been increased from 10,000 records to 18,000.

The CMC-5 can be used with either the CMC 103 CRT keystation or with the CMC 105 keystation, or with both intermixed.

The price of the augmented CMC-5 is $90.90/keystation in a 32-station system. Delivery is scheduled for the fourth quarter of 1972 from the firm at 2231 Barrington Ave., 90064.

Computerized Patient Monitoring Performed by Turnkey System

WALTHAM, Mass. – The Hewlett-Packard Computerized Monitoring System is combined with existing HP bedside monitors and central station equipment to perform calculations and intensive monitoring.

Available in a wide variety of configurations, the turnkey system is offered in 16K or 24K, with disk storage available.

The system uses the HP 2100 minicomputer. Peripherals include A/D converter, digital clock, display scope, keyboard, punch teletypewriters and line printers. A four-bed system sells for $60,000, and an eight-bed system, $69,000. Delivery is six months from 175 Wyman St., 02154.

Nashua Corp. Alternate Source For 3330-Compatible Disk Packs

NASHUA, N.H. – The 4436 disk pack from Nashua Corp. is designed to meet or exceed all IBM 3336 disk pack specifications for 3330 drives. Factory-recorded information is provided to use the servo-seeking, track following, rotation positioning sensing and data clocking functions of the system.

The price of the pack is $900 with quantity discounts available. Delivery is one week from 44 Franklin St., 03060.

Card Punch Features Portability

HUNTINGTON, N.Y. – A non-electric portable printing card punch, the Model 429 from Computer Accessories Corp., punches and prints 36 alphanumeric characters and 27 special symbols in Hollerith code.

The unit is equipped with six tab stops. It is available for $475 from 211 New York Ave., 11743.

C3 Boosts Disk Storage Capacity

FAIRFAX, Va. – C3, Inc. has increased on-line disk storage capacity of its AU 100 Data Entry System from 512,000 to 5M characters. The optional increase will be available in March from 2820 Dorr Ave., 22030.

Computer Papers Available

PORT HURON, Mich. – A new line of computer bond papers, from Port Huron Paper Co., produces a maximum number of legible carbon copies.

The papers are highly calendered, and when combined with quality one-time carbon sheets, should make more sharp, clean carbon copies.

Free samples and pricing information are available from 1700 Washington St., 48060.

Plotters Also Introduced

Programmable COM for Standard Media

By Frank Piasta
Of the CW Staff

ANAHEIM, Calif. – The latest products from California Computer Products, Inc. include two plotter systems that use Calcomp flatbed plotters and a programmable COM system that operates with all standard input media.

The plotter systems, the 7800 and 7900, include a flatbed plotter, controller, high-speed mag tape drive and basic software.

The 7800 features a 31-in. by 34-in. single pen plotter, while the 7900 is based on a 48-in. by 72-in. plotter with four program-selectable pens.

Dot Writing

The 1675 Graphic COM system uses the incremental dot writing technique for high-speed generation of lines and curves. Line segments are accomplished with a hardware line algorithm. The system includes a high-speed character generator producing 64 characters.

Input to the COM system can be from a standard magnetic tape or disk file, or directly through an interface to the CPU. The user can choose his output medium from 16 mm or 35 mm sprocketed or non-sprocketed film, as well as 105 mm full frame and microfiche.

Variable line widths and/or variable exposure result from 32 levels of control exercised by the system. A rate of up to 500,000 increment/sec can be achieved, the company said.

The basic 1675 system consists of 8K words of memory, 7-track magnetic tape unit, microfilm recorder with 16mm or 35 mm camera, standard software with host computer basic software, graphic controller software and Printsim to handle one host computer.

The basic sales price, including maintenance is $129,976. The system will lease for $4,912/mo on a one-year contract.

Applications for the plotter systems include contour and other types of mapping, integrated and printed circuit artwork production, schematic drawing preparation and general-purpose drafting.

One-year lease price of the 7800 is $1,985/mo plus $295/mo maintenance. The one-year lease price of the 7900 is $2,800/mo plus $480/mo maintenance.

The purchase price of the 7800 is $53,160 and of the 7900, $75,760. Purchase prices include one-year maintenance.

Mini-Based Communication Net Can Aid Police, Fleet Efficiency

SCHAUMBERG, Ill. – A minicomputer-based vehicle communications system from the communications division of Motorola, Inc. should increase the efficiency of dispatchers and mobile operators by eliminating many tedious manual tasks.

Designed for police departments, the "Command and Control" system can be adapted to taxi fleets and commercial truckings to provide complete, up-to-date data on each vehicle.

The turnkey system, tailored to each user, offers such services as:

Automatic vehicle location, computer-aided dispatch, electronic message conveyance, transmission of digital status and indentification data, direct computer linkup by mobile teleprinter, highway emergency radio call box system, mobile and portable two-way communications and one-way paging.

The 16K, 1.9 μsec Motorola mini controls the system. In the automobile location subsystem, it measures the signals emitted by a vehicle-mounted transmitter to several receiving sites in a given area to locate the actual position of a mobile unit within a half block and displays it on a CRT at the dispatcher station.

Vehicle status reports are maintained by the mini, using a simple mobile unit with pushbuttons to initiate data transmission to the base.

Motorola "Command and Control" system

Primary communications from the base to the mobile unit are handled by a teleprinter with voice only used in exceptional cases.

The vehicle location, status/identification, message conveyance and teleprinter systems can be combined into a computer-aided dispatch system.

Communications from the vehicle to the base are at 200 bit/sec. Data is transmitted to the mobile teleprinters at 100 word/min.

The cost of the system, in a large urban application, is about $3,000/vehicle, Motorola estimated.

Algebraic Programming

Calculator Resembles Computer

LOVELAND, Colo. – Desk-top devices, such as the 9820A programmable calculator from Hewlett-Packard, are gradually obscuring the differences between computers and calculators.

The calculator from the HP Calculator Products Division provides much of the power of an interactive time-sharing terminal and allows the user to program most mathematical and logical functions as well as the control of various peripherals.

Each instruction in the 9820A is an algebraic statement that would take many machine instructions to equal. Also, there are three types of ROMs that provide preprogrammed mathematical, I/O control or user-programmed subroutines that use little or none of the main memory of the unit.

The solid state memory is expandable from 173 registers to 429 registers. The company said the 173-register configuration was able to solve 17 simultaneous linear equations in 17 unknowns. The full 429 register memory has sufficient memory to solve up to 36 equations in 36 unknowns.

Programming and editing are simplified by immediate error detection, the availability of program printouts and the ability to insert, correct and delete program segments with automatic adjustment of program storage. Program debugging is aided by a hardware trace that can be programmed to print out the program steps desired.

The calculator includes a digital readout panel, thermal 16-char./line printer and magnetic card reader, in addition to the keyboard. The keyboard controls the operation of the unit and can be used either to perform immediate calculations or to write programs for storage in memory and later execution or storage on magnetic cards and cassettes.

Single keys control all alphanumerics and special symbols, as well as arithmetic functions and logic steps. Up to 30 keys control the optional ROM blocks that can either be used to call user-programmed or preprogrammed subroutines. A single key can call such math routines as sine, cosine, tangent, pi, log, raising a number to a non-integer power and integer.

Other math routines include arcsine, arcosine, arctangent, absolute value and inverse log functions.

Peripherals available include marked reader, output typewriter, plotter, paper tape reader, digitizer, tape cassette and two coupler/controllers. As many as four peripherals can be attached and used simultaneously.

The price of the basic 9820A with 173 registers, printer and magnetic card reader is $5,475. Option 001 adds 256 registers for a total or 429, at $1,450. The mathematical function blocks are priced at $485 each. Delivery is from stock from P.O. Box 301, 80537.

Terminal With Printer Features Fast Output

MOUNTAIN LAKES, N.J. – A printing terminal from I/O Devices, Inc., for computers, communication systems and data processing equipment, is compatible with all computer hardware.

The Model 100 features flexible forms handling and a relatively high serial impact print rate. The printer has a speed range of from 30 to 50 char./sec and is said to be more efficient than most teletypewriters because of reductions in computer, transmission line and operator times.

256 Positions

The terminal consists of the printing mechanism, the control electronics and an alphanumeric keyboard. The printing mechanism can produce a line of up to 256 print positions. An interchangeable print wheel allows the choice of different type styles or character arrangements. Up to 94 graphics characters can be accommodated on a print wheel.

The printer can tab horizontally at 300 position/sec in either direction.

The Model 100, including the print and control electronics mechanisms, power supply, keyboard and enclosure, sells for $3,100. Delivery is one month from 100 Rt. 46, 07046.

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Marriage Counselor Has Big Ideas

By Molly Upton
Of the CW Staff

MIAMI – A mathematics professor at the University of Miami has taken up marriage counseling as a prelude to modeling larger social situations.

Professor Henry W. Kunce has used the model in several classes in human relations describing racial attitudes, and "it's kind of unerring the way the thing is coming out," he said.

Kunce thinks his research team has found a way to put human beings into simulation systems. Using "a combination of very intuitive input with very rigorous mathematical simulation" the results can pinpoint possible "high strife situations," according to Kunce.

With an individual's descriptions of the partner, the output "interprets whether people end up in a steady state or enter some kind of cycle that may continue indefinitely. This is determined from any one of all possible initial conditions under which two people might begin their encounter," Kunce explained. Using one parameter, there are 256 different ways an individual can be described, which results in 65,536 ways of interrelating, he added.

The system, run on the university's IBM 360/75, has a "built-in acceptability index determining whether each person finds that situation in the particular simulation run acceptable."

Instead of resolving to change his partner, the results show the couples there are a large number of possible interconnections which may be altered.

Simulation models have been performed on about 250 couples, and the results show a "high degree of the kind of patterns that results in these couples as they interact," Kunce said.

The model used only ran one parameter at a time, such as mood or cooperation. Kunce said he didn't know how many parameters actually are needed to describe a person, but thought it was only seven or 10.

"I don't think it will ever be possible to completely describe someone," Kunce said, but as a good cartoonist can depict a personage with only a few strokes of a pen, simulation can work from a relatively simple input. "In this case we can store a person in essentially no space at all. It's really kind of frightening."

Aussie Banks Take Their DP Seriously

By William Scholes
Special to Computerworld

SYDNEY, Australia – The Camberwell branch of the Commonwealth Bank is the first outlet in the State of Victoria to handle its savings bank transactions "on-line" to a central large computer. By the end of the year, the bank expects to have extended the system to 26 branches in Melbourne, and to handle 400,000 savings accounts.

The Commonwealth Bank is possibly the leader in large-scale computer use, but virtually every Australian bank is planning to follow its example.

Commonwealth, New South Wales and Australia and New Zealand (ANZ) have announced specific plans for networks covering much of Australia.

Among the state-oriented banks, the leader is the State Savings Bank of Victoria with a system close to operational, while banks in South Australia and Western Australia have plans well under way.

Camberwell's branch of the Commonwealth is handling a part of overall trading-bank activity which is typical of most of the systems so far announced.

Tellers key the details of a savings bank transaction into special terminals, then insert the passbook. The terminal then updates the book.

The computer system, controlled by the large-scale machine in a central location, will alert the teller for a difference in the computer's record of the account's balance and the amount shown on the passbook; it will automatically enter outstanding amounts such as government child endowment payments or interest.

Ohio College Gets 1401

SALEM, Ohio – Students of electromechanical engineering technology at the Kent State Salem Regional Campus are learning computer maintenance and repair from an IBM 1401. The college wrote a proposal to IBM to apply for a 1401 when it discovered IBM was giving 25 of its computers away. The firm liked the application and granted the machine to Salem.

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Over 120 Members

Hospitals Predict 'Importance, Power' as NCR Users

CORPUS CHRISTI, Texas – Over 120 health-care organizations are now members of the Cooperative Hospital User Group (Chug), comprised entirely of NCR users.

The group's president, Roger Wilgus, said the group "will be an important and powerful factor" in shaping NCR policy toward users during the coming years, noting his group is only about two years old and is adding "several members each month."

Chug is supported "to some extent by NCR," Wilgus noted, although the group is "totally independent . . . in philosophy, direction and operation."

Societies/ User Groups

Spring Meeting

The financial support from the manufacturer is limited to hospitality suites during meetings, plus the free use of NCR meeting rooms when Chug convenes in Dayton. The group met at NCR headquarters last year, but will have its spring meeting this year in Orlando, Fla., May 10-12.

Wilgus, DP director at Memorial Medical Center here, said the group is involved in a "vigorous campaign" to increase membership and provide user benefits.

In addition to "standard user group services," the benefits include a user directory, software exchange service and a consultation service, Wilgus said.

Qualifications for membership include use of NCR equipment (or an NCR computer on order) plus performance of data processing for a provider of health care.

Chapters Aid Industry, Education

Two chapters of the Data Processing Management Association have reported community actions benefiting the educational and business sectors.

In Lawton, Okla., the Great Plains Chapter helped establish the city's new Industrial Development Program. Designed to help locate industry and match employers with new talent, the program was coordinated by Robert Head.

The Northern Illinois Chapter funded and helped implement an educational program at Coultrap Middle School, in Geneva. Besides technical assistance, the chapter's education program was able to provide $1,200 for computer time.

Head reported DPMA's programming efforts in the "occupational survey" portion of the industrial system saved three years' time.

Under the Lawton system, industries ask the city about available talent and experience. Typical requests, answered by massaging the city's computerized survey, would be for "carpenters with 10 years' experience between the ages of 20 and 40," Head related.

Other cities may obtain the programs, through their nearest DPMA chapter, he noted. The Lawton Industrial Development official can be reached through P.O. Box 63, 75301.

Both faculty and students use the Coultrap school terminal, which accesses a computer at Northern Illinois University.

SJCC Speaker

Dr. Andrei Petroviche Ershov, a leading Soviet computer authority, will deliver the luncheon address at the Spring Joint Computer Conference in Atlantic City this May, Afips announced.

His topic will be "The Aesthetics and Human Factors of Programming."

Ershov is Information Division head of the computer center, Siberian Division, USSR Academy of Sciences, Novosibirsk University.

Call for Papers

COMPUTER PROGRAM TEST METHODS SYMPOSIUM, June 21-23, Chapel Hill, N.C.

The conference will provide a forum for discussion of new concepts in computer program testing and present state-of-the-art survey of current testing methods.

Topics include: facilities that software should provide for testing software programs, the degree to which testing processes should be automated and standardized, and the relationship between various language characteristics and the difficulties of testing programs in that language.

Four copies of the first draft or a detailed 1,500-word summary must be received by March 15, 1972, by the Program Chairman, Dr. Wayne Cowell, Building 221, Argonne National Laboratories, Argonne, Ill., 60439.

Further details are available from William Hetzel, Symposium Chairman, UNC Computation Center, Chapel Hill, N.C., 27514.

Computer Users' Forum & Exposition

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The Format

Each Day	9:00-9:40	Keynote address by a nationally known expert – an independent, not a vendor – on the day's main subject. Sets the stage for discussions.
	9:40-10:30	Panel discussion led by regional experts chosen for their progressive management principles. Questions encouraged.
	10:40-11:45	Workshops – panel members conduct separate workshops. Your specific questions fielded, worked out.
	12:15-1:30	Conference luncheon – keynote speaker summarizes chief points covered during panels and workshops.
	1:00-9:00	Exhibits open, stay open til 9. Exhibitors will show the latest in hardware, software, services.

The Subjects

First Day: Data Entry

Keynote speaker; Lawrence Feidelman, President, Management Information Corp., Cherry Hill, N.J.; Editor, *Data Entry Today.*

Panels and workshops will be grouped by these four subjects:

- Keypunch replacement; key to tape, disc and cassette devices.
- OCR.
- Intelligent terminals – distributed processing.
- Direct data entry/source data automation.

Second Day: Data Communications: The Choices

Keynote speaker; Dr. Dixon Doll, Data Communications Consultant, faculty member, Graduate School of Business, Eastern Michigan University.

Panels and workshops will be grouped by these four subjects:

- Communications equipment from mainframe makers and common carriers.
- Communications equipment from independent suppliers.
- Data transmission via private (lines, microwave) networks.
- Data transmission via carriers (lines, microwave).

Third Day: Operational Efficiency

Keynote speaker; Charles Lecht, President, Advanced Computer Techniques, N.Y., N.Y., author of *The Management of Computer Programming Projects.*

Panels and workshops will be grouped by these four subjects:

- Core extensions.
- System/utility software modifications.
- Independent peripheral usage.
- Dedicated systems vs. general purpose computers.

Panel Members & Workshop Leaders

The regional experts who will run the panels and workshops have been chosen from a wide range of firms and institutions. Some will participate in more than one session, depending on their experience and expertise.

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☐ Dallas	Market Hall	Mar. 21-23
☐ Los Angeles	Ambassador	Apr. 4-6
☐ San Francisco	Fairmont	Apr. 10-12*
☐ Chicago	Palmer House	Apr. 18-20
☐ Detroit	Cobo Hall	Apr. 25-27

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'Eye-Opening' Shop Reporting System Increases Production, Labor Utilization

By Albert A. Hughes

Special to Computerworld

HOUSTON – Trying to run a busy manufacturing operation without a workable and responsive shop reporting system is a little like playing the old parlor game of blindman's bluff – you can find yourself whirling in circles trying to determine the status of work-in-process, and frequently in the dark when it comes to evaluating labor utilization.

At Camco Inc., here, management's "blindfold" was removed by a simple, computer-based communication system that collects production and labor entries from many remote work station terminals and feeds "digested" information back to the manufacturing floor while the data is still current and useful.

The time savings from the new shop reporting procedure were noticeable soon after the system was installed. Production employees now average only one minute per clock-out vs. the previous five-minute average, for a savings of four minutes per transaction – a total savings in time of from 1,600 to 1,800 hours per month.

Additionally, because data cards are generated automatically by the system, no manual keypunching is required.

The improvement in productivity is dramatic. The volume of completed jobs is up 50% with no increase in production personnel, yet the value of work-in-process has been reduced by as much as 20%, or $200,000. Average production time per job is now only eight weeks, compared with an average of 13 weeks before, a 60% cut, and a 5% increase in direct labor utilization has been effected.

The production floor information problem approached a critical point at Camco's Houston plant, where as many as 1,500 jobs can be in process.

The previous shop reporting system involved a manually executed "move tag" which doubled as a labor collection ticket. Each time a production employee began work on a job he had to write his name, employee number and shift number on the tag, as well as a 13-digit part number and an eight-digit work order number.

Each day the tags had to be collected and sent to cost accounting to check for errors – then returned for correction.

In addition, the information from the move tags had to be keypunched. The volume of work in the plant caused constant overloading of keypunching capacity, and much work had to be sent out. Errors were often compounded, causing further delays in obtaining usable production and labor information.

Under the manual shop reporting system, labor reporting was sometimes six weeks late. Moreover, when labor data was finally brought up to date and the books were closed at the end of an accounting period, there often were between $5,000 and $6,000 in direct labor costs applied to the wrong job or part numbers due to reporting errors.

Production status reports were seldom current, and it was often impossible to find a specific job in the plant or to determine if work had started on it.

Fortunately, these problems have been effectively eliminated since the new shop reporting system went into effect.

To speed the flow of production and labor information from the floor, Camco installed an IBM 2790 data communication system, and 2796 data entry units are positioned in each work area.

When work orders are now prepared in production control, the details of each order are entered into Camco's 360/30 where a master file is established for the orders. Based on the order data, the computer produces a group of prepunched cards. Each card is coded to identify the job and part numbers and a specific manufacturing operation.

The prepunched cards are sent to the work areas concerned. As each employee completes his portion of the job, he inserts the card into the data entry unit, and by using simple code selection dials, enters a two-digit employee code and single-digit codes to identify the machine center and type of transaction.

The 2796 unit also provides for entry of variable information, representing quantity completed, quantity scrapped, and any miscellaneous data required in a transaction.

All of this information, including the prepunched data on the clock-off time supplied by the sytem's integral time unit, is transmitted to a card punch which automatically produces cards for entry of the production and labor data into the computer. Employees, incidentally, are not required to clock on for each job, since the computer automatically establishes the shift start time as the start time for the first job. Thereafter, the clock-off time is also used as the start time for the next succeeding job.

Hughes is vice-president, manufacturing at Camco, Inc.

CRT Phototypesetting to Make Newspaper of Future

By Hans D. Mergeler

Special to Computerworld

GARLAND, Texas – The computer has made some inroads into the flow of copy in the newspaper, but to this date there has been no complete system, software as well as hardware, to perform the entire operation from the collection of the initial data to the final newspaper page.

Tomorrow's newspaper will have three distinct steps in the production of a page:

- Input or data capture.
- Data manipulation, correction and composition.
- Output or typesetting.

All data has to be in machine-readable form before the computer can handle it. Data can be input on different kinds of keyboards which produce a paper tape, magnetic tape, tape cartridge, or the data can be sent directly into the computer storage area. Data can also be typed on a number of typewriters, then read by an optical character recognition reader, which transfers the data onto magnetic tape.

This initial data capture can be done by the editor, rewrite man or the ad taker.

The computer will automatically number each story, count the number of characters or words, and give a listing showing the length of each individual story in different sizes or styles of type.

From a listing of stories and their length, a makeup editor can make up a page, using a digitizing table or a CRT terminal with a light pen. Advertisements can be placed in the same manner, copy can be shifted, added or deleted, and corrections can be made to the text.

In order to verify the data, a printout can be requested from the computer.

When laying out the newspaper page, the editor can point his light pen to a chart or menu which contains the styles, sizes and other functions for type size and placement, and the computer will produce a master tape in the desired format.

After all data has been verified and proofed, it will be ready for the final typesetting, then go to the composing room for retyping on a teletypewriter or typesetting on a linotype machine.

Output or Typesetting

Software at this point not only has defined the type size and leading for each story, but also its location. Heads are placed with the stories, and the computer has made sure that they all fit within the perimeters defined.

This master tape is run through a CRT phototypesetting system, where the entire page is typeset in one pass. With modern full-face write-out CRT systems, this presents no problem.

What will be the present disadvantages of a fully computerized newspaper page makeup system?

Some headings may not be blocked as before, a widow may occur where it is not wanted, and two neighboring columns may be one line off in depth. Even these little disadvantages can be overcome by more comprehensive software.

Mergeler is on the staff of Seaco Computer-Display in Garland, coordinating graphic systems development and interfacing with customers.

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CI Notes

CIG to Market 1108 Units

STAMFORD, Conn. – Computer Investors Group, Inc. has been appointed exclusive marketing representative for Data Recall/Univac Series 1108- and 494-compatible memory products.

Data Recall Corp.-Minnesota, formerly Weismantel Associates, Inc., has resumed manufacture of the Univac 1108 and 494 replacement memories.

Ex-IBMer Replaces ICL's Wall

LONDON – Sir John Wall resigned as chairman of International Computers Holdings Ltd. last week and was replaced by a former IBM executive.

The new chairman, T.C. Hudson, was managing director of IBM in the UK for 11 years before joining the board of International Computers Holdings Ltd. in 1968.

Wall said he would continue to serve the company as a part-time consultant.

Supershorts

Recognition Equipment Inc., has signed a contract for up to $1.1 million with Microdata Corp. for the use of Micro 800 and Micro 1600 minicomputers.

– – –

Nissho Iwai Co., Ltd. of Japan will sell and service Computer Machinery Corp. Keyprocessing Systems in Japan, the Ryukyu Islands and Korea.

– – –

The Canadian Department of Industry, Trade and Commerce has contracted the National Cash Register Co. of Canada, Ltd. to conduct a five-year, $16.6 million research and development program. The project involves the development of new types of equipment for the banking industry.

– – –

Storage Technology Corp. has formed the STC Field Operations Division, with Clifford F. Moss as field engineering support manager.

– – –

Atlantic Technology Corp. has received a letter of intent from Randolph Computer Corp. whereby Randolph would provide lease financing for Atlantic's ATC 2000 data display equipment.

– – –

Tracor, Inc. has sold its wholly owned subsidiary, Berkeley Scientific Laboratories, to Northrop Corp. for an undisclosed amount of cash.

– – –

Burroughs Corp. has received a $5.3 million contract from the Air Force to furnish and install EDP equipment at the Air Force Academy in Colorado.

– – –

Word Processing Products, Inc. will market the Edityper line of automatic typewriters under an agreement with Terminal Equipment Corp.

– – –

Data Products Corp. has delivered its 200th Series 2000 printer unit to University Computing Co.

– – –

Fidelity Corp. of Pennsylvania, a one bank holding company, has organized Fidelity Computer Services, Inc., which will market software systems and DP services to the banking industry.

Adapso Hearing

Software Industry Lists Grievances

By Don Leavitt
Of the CW Staff

DALLAS – For nearly five hours, members of the software industry listed their grievances against the government, IBM, Univac and the world in general, in the first of what Adapso hopes will be a continuing series of formalized "hearings" into the economic pressures of the industry.

Thrust of the early testimony was that IBM had unfairly singled out the DP service industry as a special target for poorer service than it provided other users. Later witnesses focused on alleged interference by the government in competition to provide banks in the Midwest with on-line services, and on IBM's software pricing practices.

Like a Courtroom

The meeting had some of the trappings and much of the spirit of a courtroom. The testimony of the witnesses was recorded by a court reporter and will be presented to the Justice Department. Speakers were not formally sworn in as witnesses.

While witnesses were allowed to present their testimony as they wished, questions or comments were not accepted from the general audience. Adapso legal counsel Milton Wessell and session chairman Wallace Preble limited their questions to those needed to clarify the witnesses' meaning.

IBM had singled out the service industry as a target, according to Adapso President Bernard Goldstein, by giving salesmen who handle service bureaus a markedly smaller commission for their sales. Even though they get a better base salary than other IBM salesmen, they aren't highly motivated and the result is often a poorer product, or poorer support, than is provided other users, Goldstein said.

F.R. Lautenberg, president of Automatic Data Processing, told the hearing that when he asked IBM about its treatment of its salesmen, he was told he could take his business elsewhere. Anyone who has been through a hardware conversion knows that isn't a real alternative, Lautenberg said, "besides, RCA had already taken its business elsewhere when IBM made its suggestion," he said.

The Federal Government's Home Loan Bank board also came in for heavy criticism, especially from a group of service bureau operators in the Midwest. Banks regulated by the board had been allowed to offer DP services to other banks, at rates substantially lower than would be charged by independent data centers, according to this testimony.

The board set up regulations to guide the offering of these low-cost services, but has apparently withdrawn these guidelines in the face of reports on noncompliance, Adapso was told.

The result is that the banks still can offer the services, but apparently are unrestrained in their solicitation of business from banks who already subscribe to independent services, the witnesses said.

Various witnesses from software vendors told of their inability to compete with the marketing effort that IBM puts behind its program products. The IBM sales operation is supported largely by hardware sales and could not stand alone if limited to software, the hearing was told.

Joan Van Horn also called for the separation of IBM into separate hardware and software operations and she also asked the Justice Department to consider a ruling to allow the recovery of "excess prices charged users over the years" by IBM.

Packaged Software Use Growing; Market Costs High, Adapso Told

DALLAS – Even though user sophistication and awareness of the real costs of in-house development have led to greater use of proprietary software products and services, 90% of all such offerings fail, according to Werner L. Frank, president of Equimatics Inc.

The 1971 market for packaged software amounted to about $200 million, half of which belonged to independent vendors, and half to the hardware manufacturers, primarily IBM, Frank said. The market for software and services will increase by a factor of five or 10 by 1975, he added.

Frank gave his assessment of the software industry at the Second Management Conference of Adapso's Software Section, held here recently.

More Aware User

As hardware costs continue to drop, users are becoming more aware of off-the-shelf packages, and are considering changing their own methods to use packages "as is," rather than heavily modifying software to meet peculiar "in-house" requirements, Frank noted.

Marketing costs have been a very heavy part of the cost of software in the past, particularly in the specific applications areas. Order entry and production control systems have always required a great deal of help from the vendor, whereas support packages, such as Autoflow, CUE or Scert, have demanded little of the vendor, and have been more successful, according to Frank.

For a product marketed over a three- to five-year period, marketing costs accounted for 40% to 50% of total revenues, while development costs were 10% to 14% and product maintenance costs 7% to 9%. General administrative costs, he added, amounted to 10% to 15% of revenues.

"More critical than even these cost components," Frank said, "is the fact that cash flow requirements for a product might very well necessitate an amount approaching 25% to 30% of the expected total revenues or two and a half times development costs."

The development of standard practices on quality, demonstration practices, free trials, warrantees, user groups and changes – whether modifications or enhancements – and protection of the vendor's interest, were suggested by Frank as a means of controlling marketing costs. Adapso legal counsel Milton Wessell warned the group, however, that any such considerations might be considered in violation of antitrust laws.

Alternative for Designers

Diablo Unit Prints 30 char./sec

HAYWARD, Calif. – Systems designers may find an attractive alternative to the IBM Selectric typewriter in the Hytype I electronic typewriter from Diablo Systems, Inc.

The impact unit offers simpler design and high speed, at lower cost than the IBM device, Diablo said. Called the "first automatic electronic typewriter" by the firm, it silently prints at 30 char./sec with a character selection mechanism that includes only one moving part.

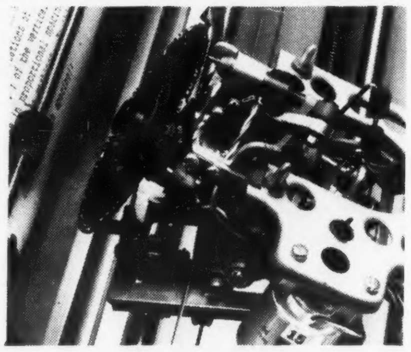
The printer uses snap-in print wheels called "Daisies" which have 96 "petals," each containing a print character, and will be available in a wide range of fonts, the company said.

The Hytpe I can also justify both margins, tab directly to any point on a line and do fine line graphing.

Standard coding is Ascii, with other coding available through the use of a ROM.

The combination of a dot density of 2,880 point/sq in. under program control with a capability to perform bi-directional vertical paper movement lets the device be used for graphics, including charts and graphs. The printer can also underline or add accent marks to a character by immediate overprinting.

Five Carbons


Hytype Print Mechanism

The Hytype I can produce up to five carbons, plus the original. An interchangeable ribbon cartridge allows the use of fabric or Mylar ribbons, with color under program control.

Twice as Fast?

The Diablo device is up to twice as fast, and simpler mechanically, at a price of about $1,000 in large OEM quantities compared with about $1,600 for the Selectric, Diablo President George F. Comstock said.

Optional features include forms handling devices such as pin-feed, single-tractor, dual tractor, split-platen and front feed. Code conversion for non-Ascii codes is offered. Non-mechanical control keyboards as well as standard keyboard configurations can be ordered.

First deliveries will take place next month from 24500 Industrial Blvd., 94545.

Di-An Controls Plans Ticket Printers

BOSTON – Di-An Controls, Inc. has introduced a line of high-speed ticket printers to selectively print a combination of characters .150 in., .4 in., and .8 in. high all on the same document.

The devices operate under computer control and print bar codes and alphanumerics at speeds up to 1,200 line/min. They also cut the paper stock and eject tickets, tags, cards or labels.

Either fanfold or continuous roll paper may be used. Individual card stock handling is also available. Various models allow for ticket heights of from 1 to 4 in. They can print up to 16 lines depending on ticket width and the height of the characters and tickets can be cut to any length.

The large character ticket printers are being used in automatic warehousing systems.

Other New Products

A key-and-reader assembly from Addo-X, New York City, is designed to insure that only authorized users can gain access to terminals.

– – –

A printer from Philips Electrologica, The Netherlands, combining a clear printout with high-speed, nearly silent operation, uses two mosaic print heads.

– – –

New OEM Products

A fully proportional servo, stepping motor efficiency, a self-cleaning read head and phototransistor sensing combine to give Electronic Engineering Co.'s Santa Ana, Calif., TTS9300BB Reader/Spooler fast, efficient and very gentle handling of punched tape, according to the company.

– – –

The core memory trainer by Fabri-Tek, Los Angeles, reproduces all the normal functions of an actual computer memory system without requiring signal conditioning or other interfacing techniques.

– – –

Another cassette-type digital magnetic tape memory system, the MT-6, has been added to the line of recording instruments offered by Teac Corp. of Montebello, Calif. The unit features a dual-gap head and bidirectional error correction.

– – –

A line of high-precision stripped down electronic chart recorders costing up to 50% less than units equipped with controls, panels, etc., has been announced by Astro-Med, West Warwick, R.I., as the "Bare Bones" series.

Univac Management Changes Set

BLUE BELL, Pa. – Michael E. Heisley has been named vice-president of marketing of Univac's Series 70 operations, the name Univac has given to the RCA customer base it recently acquired.

Executive Corner

Heisley will be responsible for the former RCA customers, product support, product assurance and education. He comes to Univac from RCA where he was vice-president of data processing administration and planning.

In another announcement, Univac named Richard F. Taylor as business manager for data entry products. Taylor was formerly director of Univac's Utica, N.Y., operations, where the 9000 Series computers and 1700 Series keypunches are produced.

Other Moves

■ Marvin G. Rogers has been named vice-president, finance for Control Data Corp.

■ William J. Texido has been appointed vice-president, Data Products Group for Itel Corp.

■ Francis V. Wagner has been elected executive vice-president of Informatics Inc. Stephen J. Tauber has joined Informatics as associate director of information management systems.

■ Raymond M. Demere Jr. and William E. Terry have been elected vice-presidents of Hewlett-Packard Co.

■ T. Jefferson Leffingwell has been appointed vice-president, corporate development of Comress, Inc.

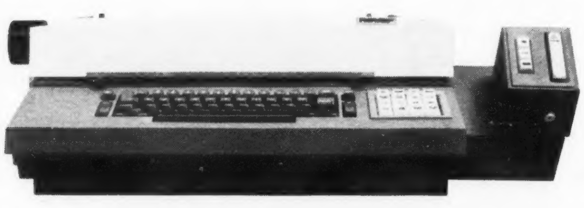
■ Leonard M. Polisar will be vice-president of corporate and legal affairs of Management Assistance Inc.

■ Robert W. Hubner and George B. Beitzel have been elected senior vice-presidents of IBM. Hubner is also on the management committee, and Beitzel is group executive with responsibility for the Office Products, Federal Systems and Information Records Divisions, as well as Service Bureau Corp. and Science Research Associates.

■ Warren A. Watson has been named president and chief executive of Tracor Computing Corp.

■ William M. Gaskins has been elected vice-president, marketing for Data Memory Inc.

■ Gerhard Bauer has been named president of Boothe Computer, Ltd. and Canadian Boothe Corp., Ltd. of Toronto.



Engineers Describe Charge-Coupled Memory System at Solid State Meeting

PHILADELPHIA – An experimental charge-coupled device (CCD) buffer memory system for a machine environment was described here recently by IBM engineers at the 1972 International Solid-State Circuits Conference sponsored by the Institute of Electrical and Electronic Engineers.

The basic building block of the operational buffer memory is a silicon chip that contains two 480-bit shift register (SR) channels, providing 960 bits of information storage per chip.

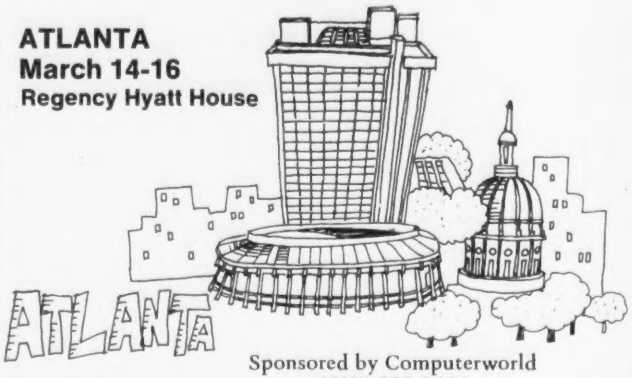
The CCD chip is mounted on a 14-pin TO-5 header to provide a functional memory module. Six memory modules, together with support circuit modules, are packaged on a 3 in. by 4 in. multilayered pluggable card for a total memory capacity of 5,760 bits.

Each 480-bit CCD shift register consists of 10 CCD channels in series, with a restore amplifier after every 48 memory bits. Six 480-bit shift registers are serially connected to form a buffer of 2,880 bits, and two 2,880-bit storage buffers contained on the six memory chips provide the total memory capacity. The shift register utilizes four phase drivers to shift at a rate of 500,000 shift/sec (data rate). A total of 3.5 W of power is dissipated on the air-cooled card.

The CCD memory was made by IBM's Components Division Laboratory at Essex Junction, Vt., and was described by Norbert G. Vogl and Thomas V. Harroun in their paper on "Operating Memory System Using Charge-Coupled Devices."

In addition to the CCD buffer storage, IBM Components Division engineers have developed other CCD shift registers. These structures have charge storage areas of .05 mil^2 and unrestored lengths of up to 256 bits.

In contrast, typical reported unrestored lengths have been on the order of 100 bits or less. An unrestored length indicates how far information can be propagated through the register before regeneration is required.



Contracts

Incoterm Corp., Natick, Mass., has received a contract from British Caledonian Airways for programmable display terminals, which will be used in the airline's passenger reservations and departure control system.

Calma Co., Sunnyvale, Calif., has received a contract from the Commerce Department's National Oceanic and Atmospheric Administration for a computerized graphic digitizing system to be used in the production of nautical charts.

Delta Data Systems Corp. has received a contract from Cybermatics, Inc. for its Telterm 2 display terminals and Multiterm 1-2 terminal multiplexers.

Computer Sciences Corp. has received a three-year contract extension for the Atomic Energy Commission for continued facility management services at the AEC's Nevada Operations Office. The contract is valued at over $3.5 million.

North Atlantic Industries, Inc. has been awarded a follow-on production contract from the Navy for digital-to-resolver interface equipment.

United Telecontrol Electronics has received a contract from Varisystems Corp. for production of a new core memory system design.

SYS Computer Corp. has been awarded a contract by Compumatics Inc. to adapt the SYS Model 1500 microprocessor for incorporation in systems emulating the IBM 1401 and 1410.

Auerbach Associates, Inc. has received a contract to provide professional and technical services for development of a Fire Department Management Information and Control System for the Fire Department of the City of New York.

TRW's Validata credit checking unit is being used by Pacific Southwest Airlines.

Alton Associates will develop a large-scale flatyard freight car control system under a contract with Union Pacific Railroad Co. The Perpetual Inventory of Car Location system will be installed at the railroad's yard in Omaha, Neb.

The U.S. Postal Service has awarded a contract to A.B. Dick Co. to develop and install bar code printing equipment for an experimental letter mail code sort system now operating in Cincinnati.

A computer-based manpower requirement system with an improved information retrieval capability will be developed by Informatics under a $135,000 contract with the U.S. Marine Corps.

Sycor, Scan-Data Have Firsts

ANN ARBOR, Mich. – Sycor, Inc. and Scan-Data Corp. scored their first ever profitable periods in the fourth quarter. After four years of terminal making, Sycor earnings reached $38,700 on record revenues of $2.9 million. In the fourth quarter of 1970, losses were $583,200 on revenues of $1.2 million.

Revenues for the full year more than tripled to $8.4 million compared with $2.6 million in 1970. Losses were trimmed to $1.4 million from the $3.5 million reported a year ago.

Sycor's back order position is strong and distributed evenly between export and domestic markets, noted President Samuel N. Irwin.

Scan-Data posted a profit of $25,700 compared with a loss of $710,023 for the quarter a year ago. Revenues reached $1.2 million, up from $209,680.

For the year, Scan-Data revenues rose 51% to $3.3 million from $2.2 million. Losses were cut to $975,398, or 88 cents per share compared with $1.8 million or $2.04 per share.

Scan-Data "has achieved the goal set early in 1971 of reaching profitable operation by year-end, despite a slower recovery of the national economy than had been anticipated," noted President Robert R. Burns.

MAI Expects Earnings of $2 Million

NEW YORK – Management Assistance Inc. (MAI) expects earnings of about $2 million for 1972 and revenues of about $60 million, a 15% increase over 1971, despite anticipated losses in the first part of the year.

In the first quarter ended Dec. 31, MAI registered an anticipated loss of $455,000 or 3 cents per share compared with a restated profit of $951,000 or 6 cents per share in the like period a year ago. Revenues for the quarter totaled $12.5 million compared with $14.6 million for the first 1971 period.

Basic/Four System

The expected loss in the first quarter was caused primarily because of start-up expenses associated with the introduction of the basic/four computer system, according to President Raymond P. Kurshan.

"Since we anticipate the initial lag of revenues behind such start-up expenses will be overcome during the next few months, management estimates MAI will operate in the third quarter at a net profit including extraordinary credits and will show an operational profit for the fourth quarter," he said.

The first quarter revenue decline resulted from the anticipated loss of rentals from the firm's existing revenue base of unit record and computer products, according to Jorge M. Gonzalez, vice-chairman.

But although revenues were down in comparison to year-ago figures, this was the first quarter in over two years in which revenues exceeded those of the immediately preceding quarter, according to the firm. MAI attributed the increase to sales of the basic/four system and the growth of service revenues.

$59 Million Written Off To CSC's Infonet Service

LOS ANGELES – Computer Sciences Corp. (CSC) has decided to write down and charge against earnings $59 million attributable to Infonet, CSC's information network services.

The firm also said it will write down and charge against earnings all development and start-up expenses for proprietary programs accumulated and deferred as of March 31, 1972, and will charge all costs as current expenses when incurred in the future.

Infonet is scheduled for completion by Sept. 30 and the cost to that date from March 31 will approximate $6 million, which will be expensed as incurred, according to the firm.

CSC said it will make "certain other adjustments" as of March 31 that will result in additional charges to earnings of the fiscal year then ending, and to those of previous fiscal years to total about $15 million.

Formerly, CSC accumulated development and start-up expenses and amortized these costs for each program on the basis of its revenues or over its anticipated useful life, whichever provided the earlier amortization.

The effect of all the write-offs as of March 31, 1972, the restricted tax benefits and fiscal 1972 operating earnings is forecast as a net reduction in stockholders' equity of approximately $40 million from the $45.8 million reported April 2, the end of fiscal 1971, CSC indicated.

Earnings for the third quarter ended Dec. 31 were almost level, $1.2 million or 9 cents a share, compared to $1.1 million, or 9 cents a share in the year-ago period. Revenues rose to $30.6 million from $30.2 million.

Nickels & Dimes

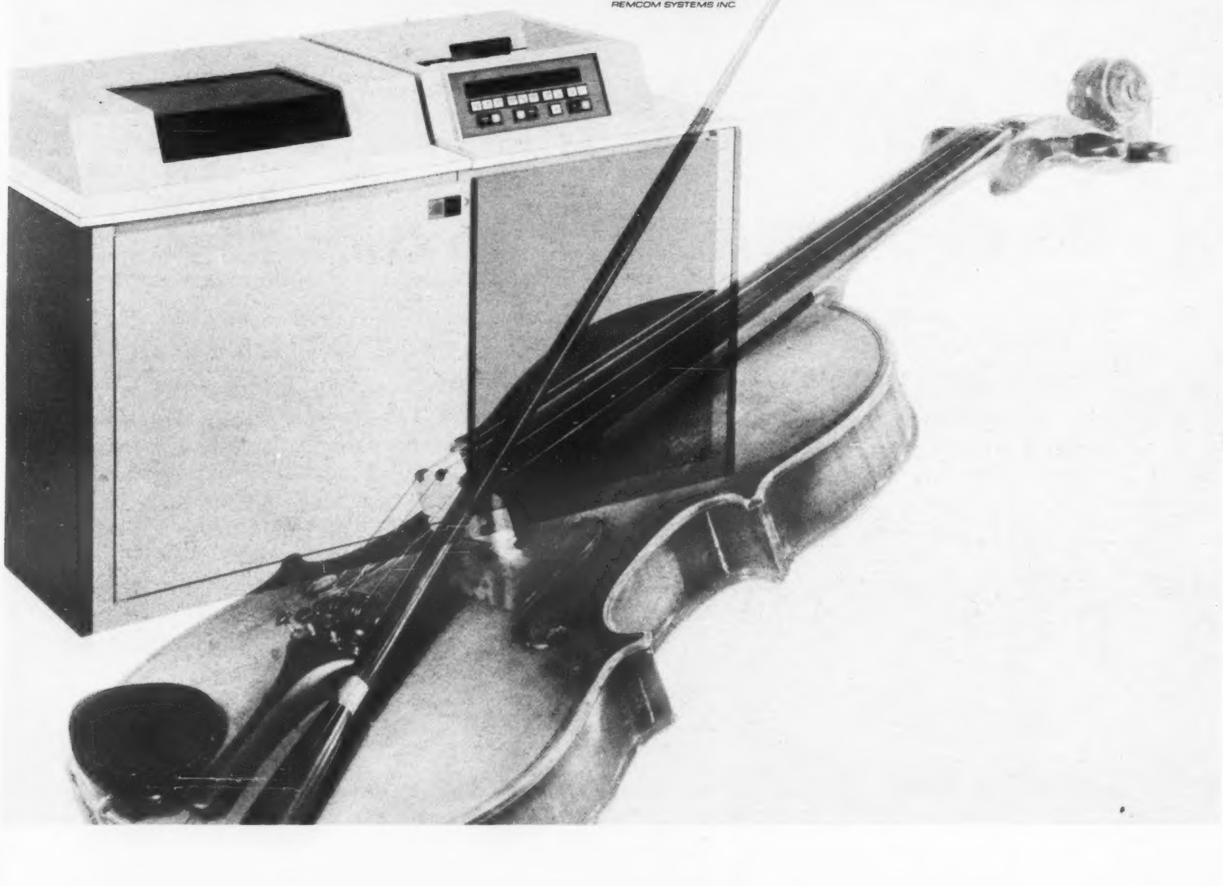
Advanced Memory Systems' loss for the quarter ended Dec. 31 was "greater than anticipated due to postponement of initial shipments of add-on memory systems for 360/65 from December to January," according to the firm. Losses were $325,793 compared with last year's $330,679, on revenues of $1.5 million compared with $314,710.

$$$

Computer Investors Group, which markets Data Recall memories, showed record revenues and earnings for the nine months ended Dec. 31. Revenues totaled $8.9 million compared with $7.3 million reported last year. Earnings were $1.3 million or 63 cents per share compared with $966,410 or 48 cents a share.

$$$

And **TEC,** maker of CRT terminals and components, scored a 361% earnings increase on almost constant revenues in the nine months ended Jan. 31. Earnings totaled $108,710 or 16 cents per share compared with $23,560 or 3 cents per share. Revenues for both periods were $3.2 million.



TRADE*QUOTES

Computerworld Stock Trading Summary

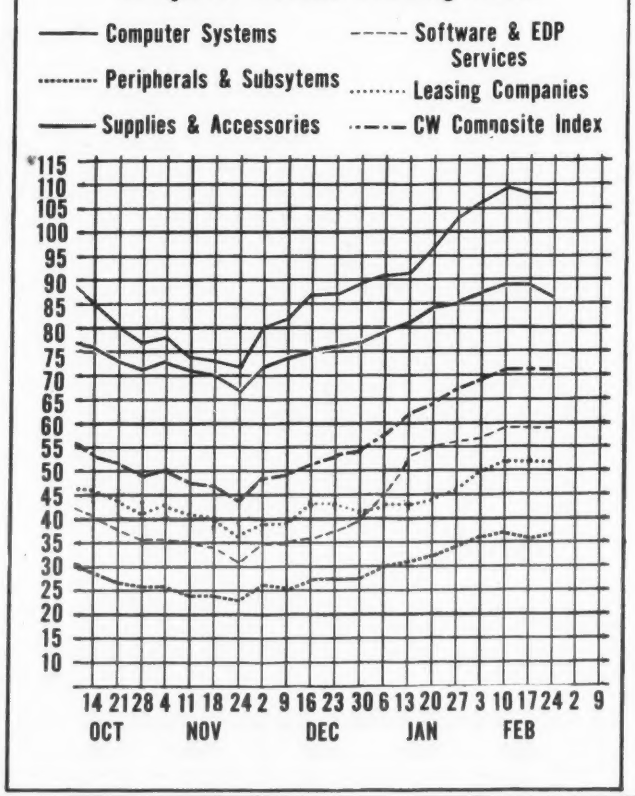
All statistics
compiled, computed
and formatted by
TRADE★QUOTES , INC.
Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, FEBRUARY 24, 1972

EXCH		PRICE 71-72 RANGE (1)	CLOSE FEB 24 1972	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 4	1 3/4	+ 1/2	+40.0
A	APPLIED DATA RES.	5- 13	6 1/8	-1	-14.0
O	APPLIED LOGIC	1- 3	2 1/4	0	0.0
N	AUTOMATIC DATA PROC	44- 86	82 7/8	-1 1/8	-1.3
O	AUTO SCIENCES	1- 8	5/8	0	0.0
O	COMPUTER DIMENSIONS	9- 17	14	+2	+16.6
O	COMPUTER NETWORK	2- 11	5	0	0.0
N	COMPUTER SCIENCES	6- 17	8 1/8	+ 1/8	+1.5
O	COMPUTER TECHNOLOGY	4- 11	6	- 1/4	-4.0
O	COMPUTER USAGE	5- 16	8 7/8	-1	-10.1
O	COMP AUTOMOT REPORTS	6- 13	7 1/4	- 1/2	-6.4
N	COMPUTING & SOFTWARE	17- 45	22 3/4	-1 5/8	-6.6
O	COMRESS	1- 4	2 1/2	+ 1/8	+5.2
O	COMSHARE	4- 9	7 3/4	- 1/4	-3.1
O	DATA AUTOMATION	1- 4	1/8	- 3/8	-75.0
O	DATA PACKAGING	6- 10	8 1/4	+ 1/4	+3.1
O	DATAMATION SERVICE	1- 3	1	- 1/8	-11.1
L	DATATAB	3- 8	7	- 3/4	-9.6
O	EDP RESOURCES	5- 16	5 1/2	- 1/4	-4.3
A	ELECT COMP PROG	2- 7	3	0	0.0
N	ELECTRONIC DATA SYS.	34- 85	56	- 1/4	-0.4
O	INFORMATICS	6- 15	9 7/8	- 1/4	-2.4
O	I.O.A. DATA CORP	1- 3	1	0	0.0
A	ITEL	7- 23	10 1/4	- 3/8	-3.5
O	KEANE ASSOCIATES	4- 14	4 3/4	- 1/4	-5.0
O	KEYDATA CORP	5- 14	8 3/4	- 1/2	-5.4
O	LOGICON	5- 8	8 3/8	0	0.0
A	MANAGEMENT DATA	5- 11	8	- 3/8	-4.4
O	NATIONAL CSS INC	7- 14	12	+ 1/4	+2.1
O	NAT COMP ANALYSTS	1- 4	7/8	0	0.0
P	ON LINE SYSTEMS INC	7- 18	14 3/8	+1 1/2	+11.6
N	PLANNING RESEARCH	10- 26	14 1/4	-2	-12.3
O	PROGRAMMING METHODS	16- 29	23 3/8	+ 1/4	+1.0
O	PROGRAMMING & SYS	1- 4	1 3/4	0	0.0
O	SCIENTIFIC COMPUTERS	2- 4	3 1/4	- 1/8	-3.7
O	SIMPLICITY COMPUTER	1- 4	2 7/8	0	0.0
O	SOFTWARE SYSTEMS	1- 3	1 3/8	0	0.0
O	TBS COMPUTER CENTERS	4- 9	5 1/8	+ 1/8	+2.5
O	TOLLEY INTL CORP	3- 12	12	+3 1/4	+37.1
O	TRACOR COMPUTING	2- 5	2	0	0.0
O	TYMSHARE INC	4- 15	9	+ 1/2	+5.8
O	UNITED DATA CENTER	2- 8	7	- 1/4	-3.4
N	UNIVERSITY COMPUTING	14- 38	19 1/2	- 3/8	-1.8
A	URS SYSTEMS	5- 11	7 1/2	0	0.0
O	VORTEX CORP	2- 6	4 1/2	- 1/2	-10.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	24- 48	37 3/4	- 3/8	-0.9
O	ALPHANUMERIC	1- 6	1 1/4	0	0.0
N	AMPEX CORP	8- 25	9 1/2	+ 7/8	+10.1
O	ANDERSON JACOBSON	5- 10	6 5/8	+ 3/4	+12.7
O	ATLANTIC TECHNOLOGY	3- 9	8 3/4	0	0.0
A	BOLT,BERANEK & NEW	4- 9	8	- 1/4	-3.0
N	BUNKER-RAMO	6- 17	9 1/2	- 1/8	-1.2
A	CALCOMP	14- 33	22 1/4	-1	-4.3
O	COGNITRONICS	2- 9	3 7/8	- 3/8	-8.8
O	COLORADO INSTRUMENTS	2- 8	2	0	0.0
O	COMPUTER COMMUN.	5- 19	5 5/8	- 3/8	-6.2
A	COMPUTER EQUIPMENT	3- 7	4 1/8	0	0.0
A	COMPUTEST	4- 20	8 3/8	+ 5/8	+8.0
O	CONSOL COMPUTER LTD.	1- 12	5/8	+ 1/8	+25.0
A	DATA PRODUCTS CORP	3- 10	5 7/8	- 3/8	-6.0
O	DATA RECOGNITION	3- 8	4 1/2	0	0.0
O	DATA TECHNOLOGY	3- 9	3 7/8	- 3/8	-8.8
O	DI/AN CONTROLS	3- 7	4 7/8	+ 3/4	+18.1
O	DIGITRONICS	2- 8	2 7/8	- 1/8	-4.1
N	ELECTRONIC M & M	5- 16	6 5/8	+ 3/8	+6.0
O	FABRI-TEK	2- 4	4 1/8	+ 1/8	+3.1
O	GENERAL COMPUTER SYS	6- 16	15	- 1/2	-3.2
N	GENERAL ELECTRIC	53-124	58 3/4	-1 3/4	-2.8
N	HAZELTINE CORP	6- 12	11 5/8	+1 1/8	+10.7
O	INFOREX INC	17- 49	37 1/2	-2	-5.0
O	INFORMATION DISPLAYS	3- 8	3 1/2	+ 1/2	+16.6
O	MANAGEMENT ASSIST	1- 2	1	+ 1/8	+14.2
A	MARSHALL INDUSTRIES	7- 27	11 1/2	+1	+9.5
N	MEMOREX	20- 78	32 1/2	- 5/8	-1.8
A	MILGO ELECTRONICS	12- 29	29	+2	+7.4
N	MOHAWK DATA SCI	15- 47	19 1/2	- 5/8	-3.1
O	OPTICAL SCANNING	6- 18	13 1/2	-2	-12.9
O	PERTEC CORP	9- 18	14 5/8	- 3/4	-4.8
O	PHOTON	6- 15	14 1/8	+ 3/8	+2.7
A	POTTER INSTRUMENT	11- 25	18 1/4	+ 1/4	+1.3
O	PRECISION INST.	7- 16	9 1/4	- 1/2	-5.1
O	RECOGNITION EQUIP	9- 26	13 1/4	- 1/4	-1.8
O	REDCOR CORP.	1- 9	1/4	0	0.0
N	SANDERS ASSOCIATES	9- 22	18 3/8	+1 1/4	+7.2
O	SCAN DATA	6- 15	12 1/8	- 3/8	-3.0
O	SYCOR INC	3- 11	9 3/4	+ 3/4	+8.3
O	TALLY CORP.	6- 16	10 1/8	- 1/8	-1.2
N	TEKTRONIX INC	28- 44	35 1/2	- 3/4	-2.0
N	TELEX	8- 22	11 3/4	- 1/4	-2.0
	SUPPLIES & ACCESSORIES				
N	ADAMS-MILLIS CORP	9- 19	12 1/2	0	0.0
O	BALTIMORE BUS FORMS	6- 10	7 3/4	0	0.0
A	BARRY WRIGHT	7- 13	12 1/4	+ 3/8	+3.1
A	DATA DOCUMENTS	14- 29	22 5/8	- 5/8	-2.6
O	DUPLEX PRODUCTS INC	8- 14	13	- 3/8	-2.8
N	ENNIS BUS. FORMS	5- 13	8 1/4	0	0.0
O	GRAHAM MAGNETICS	9- 35	21 3/4	- 1/8	-0.5
O	GRAPHIC CONTROLS	6- 15	11 3/4	0	0.0
N	3M COMPANY	96-140	140 1/4	+1 7/8	+1.3
O	MOORE BUS. FORMS	36- 48	48 1/4	+ 1/2	+1.0
N	NASHUA CORP	29- 55	54 5/8	+1 1/4	+2.3
O	REYNOLDS & REYNOLD	37- 77	37 1/2	-39	-50.9
O	STANDARD REGISTER	14- 23	18 3/4	- 3/8	-1.9
O	TAB PRODUCTS CO	8- 17	14	-1 3/4	-11.1
N	UARCO	23- 34	27	- 3/8	-1.3
A	WABASH MAGNETICS	5- 10	9 3/4	+ 7/8	+9.8
N	WALLACE BUS FORMS	18- 26	23 1/2	-1	-4.0
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	105-171	169 3/4	+4 1/8	+2.4
N	COLLINS RADIO	10- 20	16 5/8	0	0.0
N	CONTROL DATA CORP	34- 83	58 1/8	+2 1/8	+3.7
O	DATA GENERAL CORP	19- 75	74 3/4	+4 3/4	+6.7
O	DIGITAL COMP CONTROL	4- 24	22	-1	-4.3
N	DIGITAL EQUIPMENT	53- 92	90	+ 3/8	+0.4
N	ELECTRONIC ASSOC.	5- 9	8 3/4	+1	+12.9
A	ELECTRONIC ENGINEER.	5- 14	12 1/8	-1 1/4	-9.3
N	FOXBORO	25- 46	36	+ 1/4	+0.6
O	GENERAL AUTOMATION	9- 26	23 1/4	+ 1/4	+1.0
N	HEWLETT-PACKARD CO	30- 54	53 1/2	+3 1/2	+7.0
N	HONEYWELL INC	83-155	149 1/2	-1 7/8	-1.2
N	IBM	284-374	364 3/4	-3	-0.8
O	INTERDATA INC	6- 11	10	- 5/8	-5.8
N	NCR	25- 49	30 1/2	- 1/2	-1.6
N	RAYTHEON CO	27- 46	45 5/8	+ 1/4	+0.5
N	SPERRY RAND	23- 38	37 1/8	- 1/4	-0.6
A	SYSTEMS ENG. LABS	7- 18	11 1/2	- 1/2	-4.1
N	VARIAN ASSOCIATES	11- 18	15 7/8	+ 1/8	+0.7
N	VICTOR COMPTOMETER	12- 27	15	-1 1/2	-9.0
N	WANG LABS.	29- 50	38 7/8	+1 3/8	+3.6
N	XEROX CORP	85-135	134	+ 1/4	+0.1
	LEASING COMPANIES				
A	BOOTHE COMPUTER	11- 27	14 5/8	+ 1/8	+0.8
O	BRESNAHAN COMP.	2- 4	3 1/8	+ 1/2	+19.0
O	COMPUTER EXCHANGE	1- 9	1 7/8	+ 1/8	+7.1
A	COMPUTER INVSTRS GRP	7- 14	12	+1 5/8	+15.6
N	DPF INC	8- 19	10 7/8	- 1/4	-2.2
O	DATRONIC RENTAL	2- 4	3 1/2	0	0.0
A	DCL INC	5- 13	8 7/8	- 5/8	-6.5
A	DEARBORN-STORM	12- 23	20 1/2	0	0.0
A	DPA, INC.	4- 9	6 1/4	+ 3/4	+13.6
A	GRANITE MGT	7- 13	8 7/8	- 3/8	-4.0
A	GREYHOUND COMPUTER	7- 11	9 3/4	0	0.0
N	LEASCO CORP	16- 26	21 1/8	- 1/4	-1.1
O	LECTRO MGT INC	2- 5	2 5/8	- 3/8	-12.5
O	NCC INDUSTRIES	3- 10	9 1/8	- 1/4	-2.6
A	ROCKWOOD COMPUTER	3- 9	6	- 1/8	-2.0
O	SYSTEMS CAPITAL	3- 7	5 3/4	- 1/2	-8.0
N	U.S. LEASING	16- 44	43 1/8	- 1/8	-0.2

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
P=PHIL-BALT-WASH
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index



Earnings Reports

LUNDY ELECTRONICS & SYSTEMS
Six Months Ended Dec. 31

	1971	1970
Shr Ernd (Loss)	$.15	$(.30)
Revenue	7,754,463	5,159,601
Earnings (Loss)	131,106	(259,362)

TEXAS INSTRUMENTS
Year Ended Dec. 31

	1971	1970
Shr Ernd	$3.05	$2.71
Revenue	764,347,000	827,641,000
Earnings	33,723,000	29,861,000

COMPUTER USAGE
Three Months Ended Dec. 31

	1971	1970
Shr Ernd	$.05	$.01
Revenue	783,612	1,039,392
aEarnings	44,524	10,369

a-Includes tax credit of $19,000, equal to 2 cents a share in 1971 and $3,000 in 1970.

TUCSON DATA CENTER
Year Ended Oct. 31

	1971	1970
Shr Ernd	$.14	$.08
Revenue	470,372	403,164
Earnings	18,804	11,221

POTTER INSTRUMENT
Six Months Ended Dec. 31

	1971	1970
Shr Ernd	$.42	$.42
Revenue	14,179,000	14,323,000
Earnings	1,153,000	1,152,000

URS SYSTEMS
Year Ended Oct. 31

	1971	a1970
bShr Ernd	$.09	. . . . .
cRevenue	16,987,246	$16,457,287
Loss Disc Op	410,604	504,713
Spec Chg	d833,533	e160,572
Loss	607,665	152,892

a-Restated. b-Based on income before special charges. c-From continuing operations. d-Consists of write-offs of certain deferred charges, capitalized development and loans relating to the software field. e-For payment on a defaulted contract.

INFORMATICS
Nine Months Ended Dec. 25

	1971	a1970
Shr Ernd	$.19	$.15
Revenue	12,733,000	12,030,000
Loss Disc Op	112,000	140,000
Earnings	296,000	232,000

a-Restated.

ELECTRONIC DATA SYSTEMS
Three Months Ended Dec. 31

	1971	1970
Shr Ernd	$.25	$.21
Revenue	21,263,926	18,668,929
Earnings	2,970,952	2,519,857
6 Mo Shr	.48	.39
Revenue	41,735,177	34,969,307
Earnings	5,719,582	4,633,229

PLANNING RESEARCH
Three Months Ended Dec. 31

	1971	a1970
Shr Ernd	$.16	$.14
bRevenue	19,359,249	15,952,763
Earnings	961,252	757,470
6 Mo Shr	.30	.31
bRevenue	36,062,145	31,188,621
Earnings	1,807,675	1,727,353

a-Restated to reflect discontinued operations and acquisitions on a pooling-of-interests basis. Also, excludes effect of start-up costs net of related revenues. b-Includes revenues from International Reservations Corp.

COMPUDYNE
Three Months Ended Dec. 31

	1971	1970
Shr Ernd	$.02	. . . . .
Revenue	5,709,248	$5,856,416
Earnings	131,507	57,517

DIEBOLD
Year Ended Dec. 31

	1971	1970
Shr Ernd	$1.86	a$1.90
Revenue	139,312,177	135,896,534
Earnings	8,756,974	8,795,541
3 Mo Shr	.54	a.51
Revenue	36,695,973	33,207,669
Earnings	2,557,493	2,327,006

a-Adjusted to reflect 3% stock dividend in January and three-for-two stock split in May 1971.

STERLING COMPUTER
Three Months Ended Dec. 31

	1971	1970
Shr Ernd	a$.04	$.03
Revenue	705,459	619,480
Earnings	86,633	b61,285
9 Mo Shr	a.12	.07
Revenue	2,054,697	1,881,868
Earnings	246,762	b154,593

a-From continuing operations. b-Net of discontinued operations amounting to earnings of $5,843 in the quarter and $9,004 in the nine months.

New... AUERBACH EDP Users' Notebook

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What's in it for you

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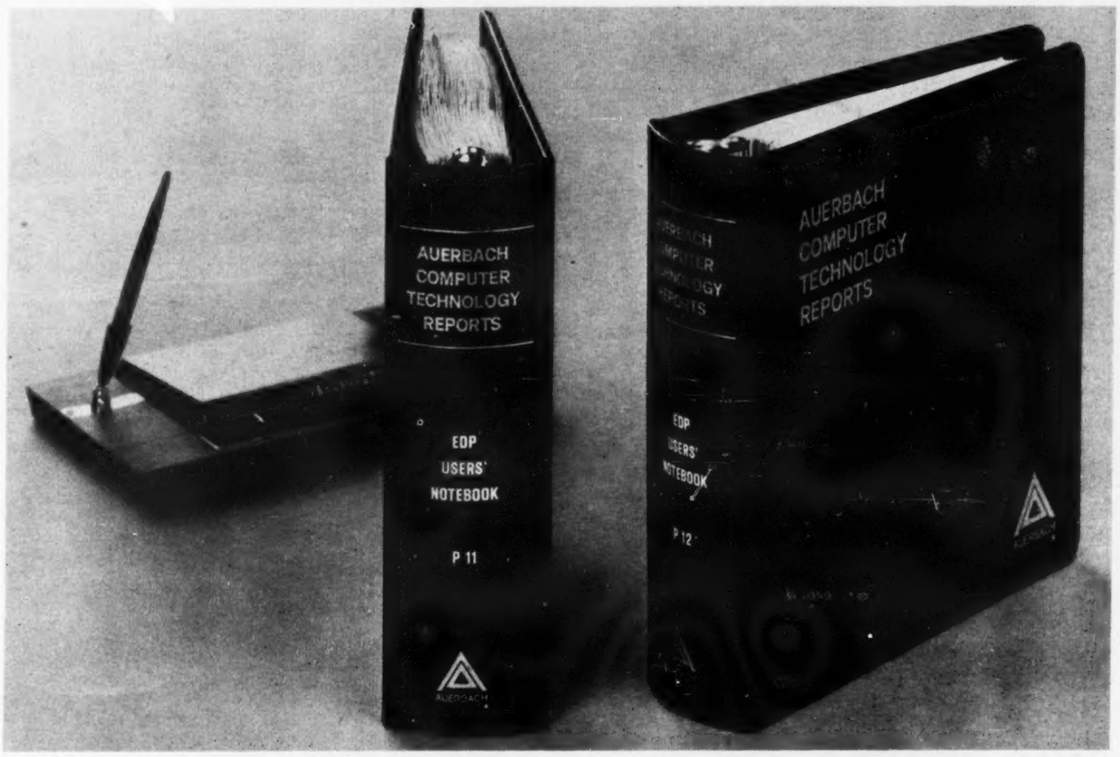

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